Appendix C

SAFETY

TECHNICAL REVIEW OF VENOCO'S PROPOSAL TO CRUDE OIL PRODUCTION THE BEACHFRONT LEASE LOCATED ON STATE LEASE PRC-421

1.0 INTRODUCTION

The Beachfront Lease is located on State Lease RPC 421, adjacent to the Sandpiper Golf Course, near Hollister Avenue and Highway 101. The facilities occupies approximately 10,000 square feet of pier space. The well is not currently producing. Venoco is proposing to return these facilities to production. This would entail removal of old production equipment from Oil Piers 421-1 and 421-2, installing new oil separation equipment on Pier 421-2 and reactivation of the oil well on Pier 421-2 with the capacity of producing up to 700 BPD of Crude oil.

2.0 SCOPE OF REVIEW

This review is to be limited to the oil and gas production facilities required to lift the produced fluid to the surface, separate the oil water and gas, dispose of the water and gas and to transport the crude oil to existing Line 96. Venoco's proposed production plan was reviewed along with three alternate's plans.

2.1 Proposed Plan Key Components

- Well 421-2 will be used as the production well for an estimated 10 years. (This is the projected time required to produce the recoverable reserves.)
- Electric Submersible Pump (ESP) to lift the Crude Oil.
- Cyclone separation of the Crude oil from the water and gas located at Pier 421-2.
- Rejection of the produced water and gas down Well 421-1.
- Transportation of the crude oil in a 2" flow line protected inside an existing 6" line to line 96 and water/gas in a 2" flow line to well 421-1 inside the same 6" line.
- See Diagram no. 1.

2.2 Alternate Plan 1 Key Components

- Well 421-2 will be used as the production well for an estimated 10 years. (This is the projected time required to produce the recoverable reserves.)
- Electric Submersible Pump (ESP) to lift the Crude Oil.
- Transportation of the combined stream of oil, water and gas via 2" flow line, protected inside the 6" line to the Ellwood Onshore Facilities for Separation and water disposal.
- Crude oil and gas would be mixed with the Holly crude oil and gas streams.
- See Diagram no. 2.

2.3 Alternate Plan 2 Key Components

- Well 421-2 will be used as the production well for an estimated 10 years. (This is the projected time required to produce the recoverable reserves.)
- Place a Gas Engine Powered Sucker Rod (similar to the original) to lift the Crude Oil.

- Transportation of the combined stream of oil, water and gas via 2" flow line, protected inside the 6" line to the Ellwood Onshore Facilities for Separation and water disposal.
- Crude oil and gas would be mixed with the Holly crude oil and gas streams.
- See Diagram no 3.

2.4 Alternate Plan 3 Key Components

- Well 421-2 will be used as the production well for an estimated 1 year. (This is the projected time required to test the relationship between well head pressure and natural crude oil and gas seepage.)
- Place temporary pump on the well to lift the Crude Oil.
- Transportation of the combined stream of oil, water and gas via temporary 2" flow line to the Ellwood Onshore Facilities for Separation and water disposal.
- Crude oil and gas would be mixed with the Holly crude oil and gas streams.
- Subject to test results, the well may shut in and plugged or continued to be produced.
- See Diagram no 4.

3.0 DISCUSSION OF PROPOSED PLAN

3.1 Electric Submersible Pump (ESP)

Electric Submersible Pump (ESP) to lift the produced fluids is a proven technology that has been used for a number of years in the oil and gas industry. A multistage pump is placed in the casing below the liquid level. The variable speed electric motor use is to driver the pump. The pressure and flow rate is controlled by changing the speed of the pump. The pump is protected by a number of safety devices including under current, over current, RPM and down hole pressure.

The pump is designed to pump 1000BPD of well head fluid at 978 psig discharge pressure. With the pump placed at -2000 feet, the estimated Tubing Shut in Pressure is 415 psig at current frequency of 60 Hz.

The Production tubing, well head and valves through the Surface Safety Valve (SSV) are all rated at 3000 pisg, well above the 978 pumping down hole pressure and 415 psig SITP.

The SSSV and the SSV provide over pressure protection if required.

With the ESP installed down hole inside the casing there are the advantages of the equipment not being exposed to any wave action or potential noise pollution.

Venoco repaired the casing during the work over in 2002 and currently do not plan to do any additional testing prior to startup. The potential for leakage may be remote but a retest of existing casing would be prudent.

3.2 Cyclone Separation

Cyclone separation of the Crude oil from the water and gas is located at Pier 421-2 and would be exposed to the weather and potential wave forces. Cyclone separation is a proven technology and been used for a number years in the oil and gas industry. Cyclone liquid gas separation has been used well over 40 years and the liquid- liquid hydro-cyclone separation has been used for nearly 20 years.

The operating pressure of the separators is approximately 200 psig and the design pressure is 740 psig. Both Vessels will be designed and fabricated in accordance with ASME VIII pressure vessel code. Venoco has advised that they plan to install pressure safety valves (PSV) on each vessel to ensure thermal and fire over pressure protection.

It is planned to allow the PSV to discharge to the atmosphere with any liquids being collected in the open well cellar. Thermal or fire PSV normally do not need to operate. In this case, three conditions must exist, the vessel must contain liquids, the manual valves on the vessel which are normally opened for the system to operate must be closed and a heat source must be present such as a fire or the sun.

If the vessel were completely full of liquid, the volume would be approximately 270 gallon.

The separators and associated instruments, valves and equipment will be connected either with flanges, hubs, screwed connections which provide potential crude oil and gas leakage points. Equipment such as this would normally be located in an area where it would not be exposed to potential wave action.

3.3 Rejection of the Produced Water and Gas Down Well 421-1

Rejection of the produced water and gas down Well 421-1 is located within a few hundred yards of the producing well. As with 421-2, the injection well's casing was repaired and tested as part of the 2002 work over.

The required injection pressure is outside the scope of this review, but with 3000 psig well head tubing design pressure the system is capable of containing the ESP pump pressure.

3.4 Transportation of the Crude Oil

Transportation of the crude oil is in a 2" flow line protected inside an existing 6" line to line 96 and water/gas in a 2" flow line to well 421-1 inside the same 6" line. The existing 6" flow line is of unknown condition. It is planned to clean the line, pressure test it, install a plastic liner and install two 2" flow lines inside the 6" line. The 6" line will provide mechanical protection for the 2" flow lines and containment should a leak develop in the flow line.

The line will be monitored by a Pressure Switch High on the annulus. Electrical short tests are planned to ensure isolation between the 2" flow lines and the 6" protective casing. If a leak developed in the 6" casing prior to a leak developing in the 2" flow line, the PSH would not trip.

The flow line could contain approximately 300 gallons of fluid when completely liquid packed. Consideration should be given to charging the annulus with 20 psig of nitrogen This would provide a means of monitoring both the 2" flow line leak by high pressure trip and a leak in the 6" casing by a low pressure trip.

Line 96 has a reported design pressure of 285 psig. The proposed production equipment and piping has a design pressure of 740 psig. The well SITP is 415 psig. Over pressure protection will need to be considered for Line 96.

4.0 DISCUSSION OF ALTERNATE PLAN NO 1

Electric Submersible Pump (ESP) to lift the produced fluids as discussed in section 3.1 above is planned to be used.

Separation equipment located at Pier 421-2 is not part of this alternate proposal. Separation would be done at the EOF. This has the advantage of not exposing production to the environment. Less likely to have leaks and the need for local PSV has been eliminated.

Rejection of the produced water and gas down Well 421-1 would not be required; this would be handled at EOF. Again the advantage of less equipment at the pier.

Transportation of the combined crude oil water and gas stream in a 2" flow line protected inside an existing 6" line to EOF. The installation of a single line inside the 6" protective casing has the advantage of either of the flow line coating being damaged during installation. This would mean a better corrosion protection.

The line will be monitored by a Pressure Switch High on the annulus. Electrical short tests are planned to ensure isolation between the 2" flow lines and the 6" protective casing. If a leak developed in the 6" casing prior to a leak developing in the 2" flow line, the PSH would not trip.

The flow line could contain approximately 300 gallons of fluid when completely liquid packed. Consideration should be given to charging the annulus with 20 psig of nitrogen This would provide a means of monitoring both the 2" flow line leak by high pressure trip and a leak in the 6" casing by a low pressure trip.

5.0 DISCUSSION ALTERNATE PLAN 2

- Well 421-2 will be used as the production well for an estimated 10 years (This is the projected time required to produce the recoverable reserves). A gas engine power sucker rod pump would be used to lift the crude oil to the surface. The technology is prove and was used in the early days of oil and gas production. It is still used in many oil fields through out the world.

This alternate proposal is being considered because it was used prior to production shut in.

It would require a fuel gas line to be laid from EOF to supply fuel for the Gas engine. There would be an increase in noise 24/7.

- The equipment would be exposed to the environment and the potential of wave forces during a storm.
- Combined production of oil, water, and gas would be transported via 2" flow line, protected inside the 6" line to the Ellwood Onshore Facilities for Separation and water disposal.

  The line will be monitored by a Pressure Switch High on the annulus. Electrical short tests are planned to ensure isolation between the 2" flow lines and the 6" protective casing. If a leak developed in the 6" casing prior to a leak developing in the 2" flow line, the PSH would not trip.

  The flow line could contain approximately 300 gallons of fluid when completely liquid packed. Consideration should be given to charging the annulus with 20 psig of nitrogen This would provide a means of monitoring both the 2" flow line leak by high pressure trip and a leak in the 6" casing by a low pressure trip.

6.0 DISCUSSION OF ALTERNATE PLAN NO. 3

- Electric Submersible Pump (ESP) to lift the produced fluids as discussed in section 3.1 above is planned to be used to test the well for approximately one year.
- Separation equipment located at Pier 421-2 is not part of this alternate proposal. Separation would be done at the EOF. This has the advantage of not exposing production to the environment. Less likely to have leaks and the need for local PSV has been eliminated.
- Rejection of the produced water and gas down Well 421-1 would not be required; this would be handled at EOF. Again the advantage of less equipment at the pier.
- Transportation of the combined crude oil, water, and gas stream in a 2" flow line protected inside an existing 6" line to EOF. The installation of a single line inside the 6" protective casing has the advantage of either of the flow line coating being damaged during installation. This would mean a better corrosion protection.

  The line will be monitored by a Pressure Switch High on the annulus. Electrical short tests are planned to ensure isolation between the 2" flow lines and the 6" protective casing. If a leak developed in the 6" casing prior to a leak developing in the 2" flow line, the PSH would not trip.

  The flow line could contain approximately 300 gallons of fluid when completely liquid packed. Consideration should be given to charging the annulus with 20 psig of nitrogen This would provide a means of monitoring both the 2" flow line leak by high pressure trip and a leak in the 6" casing by a low pressure trip.

7.0 ATTACHMENTS

7.1 Flow Diagram No. 1

7.2 Flow Diagram No. 2

7.3 Flow Diagram No. 3

7.4 Flow Diagram No. 4

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7.5 List of Project Code and Regulations to be Used

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7.6 List of Technical Questions and Answers Provide by Venoco Dated 9-19-06

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TRUCK TRANSPORTATION EXCERPT FROM HM

Numerous studies related to transportation risk have been conducted, including those prepared by the National Highway Transportation Safety Board (NHTSB), the U.S. Department of Transportation (DOT), the California Highway Patrol (CHP), studies published in the Journal of Loss Prevention and the Journal of Transportation Engineering, as well as European studies published in the Journal of Hazardous Materials.

The Federal Motor Carrier Safety Administration (FMCSA), part of the DOT, operates and maintains the Motor Carrier Management Information System (MCMIS). MCMIS contains information on the safety fitness of commercial motor carriers and hazardous material shippers subject to the FMCSA Regulations and the 49 CFR Hazardous Materials Regulations. According to an FMCSA detailed analysis (FMCSA 2001), the non-hazmat accident rate was estimated to be 0.73 accidents per million vehicle miles and the average hazmat accident rate was estimated to be 0.32 accidents per million vehicle miles (0.20 per million km). Accident rates for class 3 materials, which include flammable and combustible liquids, which would be transported in non-pressurized, “thin” shell tankers, had a combined accident rate of 0.5 accidents per million miles (0.3 accidents per million km).

Caltrans maintains a database system of all traffic collisions that occur on the California Highway system. Title 23 Code of Federal Regulations (CFR) 1204.4, and California Vehicle Code (CVC) section 2900 requires the State of California to have a data collection system as part of the process to reduce the number and/or severity of collisions on roads. In response to Title 23, the State developed the Traffic Collision Reports (TCRs) used by police agencies to collect and compile collision data. When the State developed the TCRs, they also developed the collision database SWITRS that resulted from the data collected and compiled from the traffic collisions reports maintained by the CHP. The State also developed the Traffic Accident Surveillance and Analysis System (TASAS) used by Caltrans to analyze collision, traffic, and highway data collected and compiled by the CHP and Caltrans.

State highway related collision reports receive coding for a range of accident details. Caltrans then receives this State highway related data on a weekly basis for the TASAS system.

A study conducted by Marine Research Specialists (MRS) for the County (Santa Barbara County 2004) obtained data from Caltrans on major highways in Southern California and in the central San Joaquin Valley (Highways 101, 5, 405, 166) from the TASAS system. The study examined collisions for a 10-year period from 1991 until 2001, and collected data on 13,300 collisions associated with over 18.6 billion truck miles (30 billion km). Accident rates for all trucks along all routes examined was estimated to be 0.72 accidents per million miles (0.45 per million km). The MRS report also estimated reduction in accident frequency due to mitigation measures, such as training and driver hiring practices. A summary of accident rates is shown in Table 4.2-14 below.

Table 4.2-14
Summary of Truck Accident Rates

Source	Accident Rate, per million miles
FCMSA, all trucks, 1995-1997	0.72
FCMSA, hazmat trucks only, 1995-1997	0.32
FCMSA, non-pressurized liquid only, 1995-97	0.50
DOE, bulk liquids, MC306 trucks	2.50
Corsi, tanker trucks, (Corsi 2000)	0.94
MRS, TASAS, all trucks, So. Calif., 1991-2001	0.72

Given that an accident has occurred, the probability that a release also occurs is called the conditional probability. Conditional probabilities give the percentage (or fraction) of the time a spill, fire, or explosion might occur given that an accident has happened. A number of different studies define a range of conditional spill probabilities. The probability of release from a truck carrying hazardous materials involved in an accident as described in these studies ranges from 2.6 percent to 35 percent (Harwood 1993, FMCSA 2001, USDOT 2000).

Section 9812 – Santa Barbara County
ACP5

Map of Santa Barbara County Showing Three Coastal Reaches and Included Ecologically Sensitive Sites

Section 9812 - Santa Barbara County

Table of Contents

9812.1 Environmentally Sensitive Sites

The purpose of this section is to provide background, definitions, and philosophy behind the Site Summary and Strategy Sheets in ACP Section 9800. Both Federal and State laws require that sites having special ecological sensitivity be identified and provisions be made to protect or otherwise mitigate for the site impacts from spills. In California these locations are termed "Sensitive Sites". A narrative and diagram of each site with specific ecological and operational information has been developed.

The development of specific protection strategies to meet the site specific needs was conducted using a standardized protocol to ensure consistency for California's entire coast. The process of site visits, training exercises, and discussions allows trustees and response experts to exchange concerns and feasibility limitations in forming protection strategies. Using this approach, the local area committee incorporates input of State and Federal trustees, and stakeholders (industry, spill response co-ops and contractors, non-governmental environmental groups, and other agencies) to form consensus on the appropriate site protection strategies and response resources. The committee will revise strategies based on new knowledge and to adapt to changing conditions.

The environmental sensitivity differs by location or season depending on conditions or the presence of species. A ranking index was developed in order to identify the relative protection priority of sites. These ranks define the environmental sensitivity of the area and its resources at risk. Accordingly each site is ranked A, B, or C based on the following definitions:

Category A - Extremely Sensitive - first priority for protection:
Wetlands, estuaries and lagoons with emergent vegetation (marsh-riparian ESI 10) Sheltered tidal flat (ESI 9); and Habitats for rare, threatened or endangered species (State or Federal); Sites of significant concentrations of vulnerable and sensitive species (e.g. pinniped pupping)

Category B - Very Sensitive - second priority for protection
Major pinniped haulout areas during non-pupping seasons; Moderate concentrations of vulnerable and sensitive species; other low energy habitats (ESI types 8A, 8B, 7 and 6B)

Category C - Sensitive - third priority for protection
Higher energy habitats (ESI 6A through 1) for example: *Habitats important to large numbers of species of sport, commercial value, and scientific interest or species experiencing significant population declines though not yet threatened.*

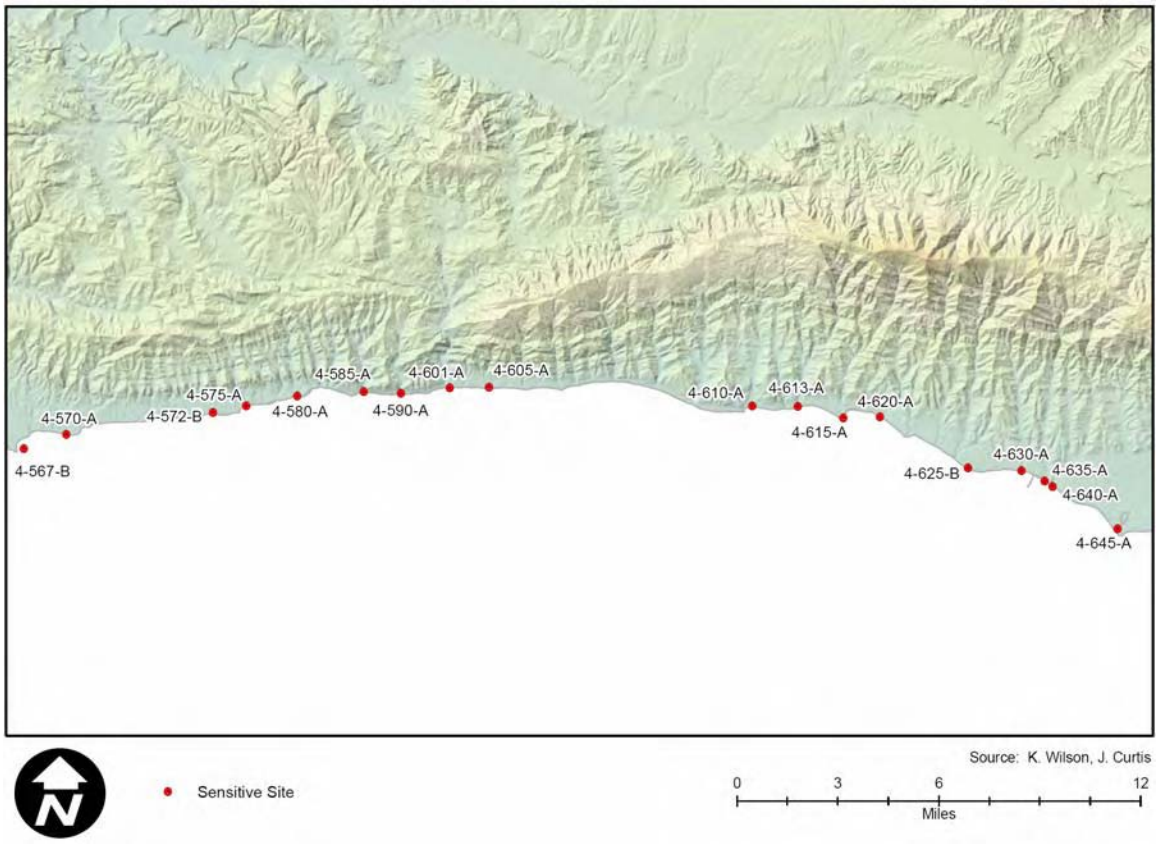
This section provides detailed information on Environmentally Sensitive Sites in Santa Barbara County. Each site is described on three sections: Site Summary, Site Strategy, and Diagram. The Site Summary page provides a brief description of the site including location, access, specific concerns, agency contacts, etc. The Site Strategy page provides specific information on response strategies to be implemented to protect the site from marine oil spills as well as recommended resources, site logistics, and access

information. These Site Strategies are intended as guidelines to assist responders during the initial hours of a spill response. The Diagram page shows the protection strategies, topography and roads.

The intent of the site strategies is to provide initial recommendations to protect the site until actual conditions and needs at sensitive sites can be determined to provide appropriately modified strategies. In other words, strategies presented here are flexible and may require modification in real response situations. The strategies provided here are the best available response options for foreseeable typical wind and current conditions at the respective sites. Those conditions may not prevail at the time of the spill. Responders and planners may need to adjust strategies to meet the needs presented by prevailing conditions; following the initial emergency response many sites may have alternative strategies to accommodate differences in conditions.

Most sites have more than one protection strategy. These additional strategies may be used as back-ups to the primary protection strategy or as alternatives to accommodate prevailing conditions. It should be understood that the described strategies are intended as initial protection strategies for the first 24 hours of a spill. Additional or modified protection measures should also be considered.

Santa Barbara County West – Sensitive Sites



Site Summary- Bell Canyon Creek

4-640 -A

County	USGS Quad	Thomas Guide Location	NOAA Chart	Latitude N	Longitude W
Santa Barbara	Dos Pueblos Cany	993 D-E x 2-3	18721	34.4267	119.9083

Last Page Update: 10/1/2005

SITE DESCRIPTION:

Bell canyon creek is a moderate sized creek with a well developed lagoon just west of sandpiper golf course; the sand berm which develops during summer is usually relatively low and the lagoon is subject to wash over especially during high tides. The creek flow during winter is usually enough to breach the berm. The beaches to the east and west are of fine to medium-grained sand, and often have very high volumes of debris (mostly wood and kelp) especially after rains. The Venoco oil facility lies 1/4 mile inland (see remarks).

SEASONAL and SPECIAL RESOURCE CONCERNS

Whenever lagoon mouth is open or subject to high tide wash over wetland biota are at risk.

RESOURCES OF PRIMARY CONCERN

Wetland biota: including Tidewater goby and possibly Steelhead trout; plus waterfowl and marsh vegetation

Waterfowl, seabirds (including Brown pelicans) and various shorebirds.

Sea otters have been known to pass through the area.

CULTURAL, HISTORIC, and ARCHEOLOGICAL SENSITIVITIES

Cultural, Historical, and Archeological sites are known to exist in the area, however, the exact locations of these sites must be ascertained by contacting the Native American Heritage Commission at (916) 653-4082 and State Office of Historical Preservation (916) 653-6624, and/or the Central Coast Archeological Information Center (805) 893-2474.

KEY CONTACTS: Trustee (T); Entry/Owner/Access (E); Cultural (C); or Other Assistance (O)

Type	Name and Title	Organization	Phone (1st)	Phone (2nd)
	Mike Glassow	Central Coast Archeological Information Center	(805) 893-2474	
	Dave Ono Marine Biologist	DFG - Marine Region (Fisheries)	(805) 569-1221	
	Kristine Barsky Marine Biologist	DFG - Marine Region (Nearshore Species)	(805) 985-3114	
	Maurice Cardenas Fisheries Biologist	DFG - South Coast Reg 5 (Freshwater Species)	(805) 640-1852	
	Morgan Wehtje Wildlife Biologist	DFG - South Coast Reg 5 (Habitat	(805) 491-3571	
	Stan Glowacki	NMFS - Steelhead	(562) 980-4061	(562) 980-4000
	Greg Villenueve Vice Pres Golf Operation	Sandpiper Golf Course (Access)	(805) 968-1541	(805) 698-8332
		USFWS Ventura Office - Federally listed T/E species	(805) 644-1766	
		Venoco - Ellwood Plant (Emergency Numbers)	(805) 961-2339	(805) 961-2375
	Tony Martinez	Venoco (Ellwood Plant & Platform Gilda)	(805) 961-2301	
	Jeff MacDonald Ellwood Ops Supervisor	Venoco (Ellwood Plant & Platform Holly)	(805) 961-2301	(805) 455-9666

ADDITIONAL SITE SUMMARY COMMENTS:

Excellent aerial photo of site can be found on the California Coastal Records Project website (http://www.californiacoastline.org/). Image number of site: 200404648

REFERENCES:

1. RPI-ESI MAPS SOUTHERN CAL ATLAS
2. INVENTORY OF COASTAL WETLANDS IN SANTA BARBARA COUNTY - INTERIM REPORT. R. AMBROSE. 1993.

Site Strategy - Bell Canyon Creek

4-640 -A

County	USGS Quad	Thomas Guide Location	NOAA Chart	Latitude N	Longitude W
Santa Barbara	Dos Pueblos Cany	993 D-E x 2-3	18721	34.4267	119.9083

Last Page Update: 10/1/2005

CONCERNS and ADVICE to RESPONDERS:

Primary spill threats from inland and marine sources. The primary objectives are to exclude oil from lagoon, pre-clean debris, and clean oil from shorelines. The lagoon is habitat for a Threatened/Endangered fish and other sensitive species. Animals and habitat can be injured by oil and response/cleanup activities unless responders minimize disturbance in stream, lagoon, and associated vegetation; avoid trampling oil into sediments; and follow protective conditions from IC and resource biologists.

HAZARDS and RESTRICTIONS:

Water Contamination - Unhealthy levels of coliform bacteria have been found intermittently in streams and on beaches in the Santa Barbara County area. Check with the Santa Barbara Ocean Quality Hotline, 805-681-4949, regarding health conditions prior to engaging in any activities which would require direct water contact. Use appropriate PPE, safety procedures, and include reference to potential health problems in any site safety plan.

SITE STRATEGIES

In the event of an inland spill it is important to control, confine, and recover as much of the oil as close to the source of discharge as possible using off-stream containment and collection methods. Unless otherwise stated, the strategies and equipment described below are for marine spills. However, they can be adapted for inland spills when the need arises. Resource needs will vary depending upon the location of the spill source, topography, existing habitat and biota, stream flows, and weather conditions.

Strategy 4-640.01 **Objective: Berming - Prevent oil from contaminating the inlet when it is subject to tidal influence, low flows are present, and/or wave washover could occur if berm materials are present.**

Berming - First, consult with resource trustees regarding wildlife issues before undertaking this activity. Build an earthen berm across the mouth of the inlet using onsite materials obtained from unvegetated areas below the high tide line to minimize damage to wildlife and habitat. Install under flow pipes in the berm to allow through flows and/or a spillway with a filter barrier to accommodate flow increases as weather conditions dictate. Cover the berm with sheet plastic to minimize erosion. Second, back the berm with swamp and sorbent booms to prevent contamination from entrainment, leakage and or washover. If there is skimmable oil present, deploy sorbents and contact the IC immediately regarding the use of skimmers and or other mechanical means for collecting oil. Monitor berm and associated features to maintain their integrity and effectiveness.

Strategy 4-640.02 **Objective: Booming - Deploy exclusion booms across the inlet entrance to protect sensitive species and habitats when suitable berm building materials are unavailable, water flows are too great, or water depths are too great for berming.**

Booming - Deploy exclusion booms across the inlet to minimize the likelihood of oiling the estuary. Place the booms in a configuration which forms an oil collection pocket which can be adjusted to accommodate changes in flow direction. Back exclusion booms with sorbent booms to minimize leakage. Line the shorelines and any side channels within the inlet to prevent collateral oiling. If there is skimmable oil present, deploy sorbents and contact the IC immediately regarding the use of skimmers and or other mechanical means for collecting oil. Monitor, adjust, and replace booms at least 2 x per day to maintain their integrity and effectiveness.

Strategy 4-640.03 **Objective: Shoreline Precleaning - Prevent oiling of kelp, driftwood, vegetative debris, trash, and other materials to reduce collateral contamination and disposal problems.**

Shoreline Precleaning - Consult with resource trustees regarding wildlife issues before undertaking this activity. Remove and store kelp, driftwood, vegetative debris, trash, and other materials which could become oiled and create environmental hazards and disposal problems. Pre-cleaning of debris from shorelines will be conducted by hand crews to the greatest practical extent to minimize disturbance to wildlife and their habitats. If heavy equipment or vehicles are required for this operation, request consultation from resource trustees and contact the IC for authorization. Segregate and dispose trash. Replace unoiled debris in its former location once the threat of oiling is past.

Table of Response Resources

Strategy Number	Harbor Boom	Swamp Boom	Other Boom	Sorb Boom	Anchoring Systems		Boom Boats	Skiffs	Skimmers	Staff	
			Amount and Type		Num	Type and Gear			Num and Type	Deploy	Tend.ing
4-640.01		400		400	4						
Special Equipment: 1 Front End Loader, 1 Roll Plastic, 3 Culvert Pipes, 20 Sand Bags, 15 Stakes (metal), 1 Stake Driver, 10ft Construction Fencing, 1 Hand Tools											
4-640.02		400		400	8			1	1	5	2
Special Equipment: 1 Waste Bin (20 yd), 1 Portable Oil Storage Tank OR Vacuum Truck											

4-640.03		5

Special Equipment: 1- Vehicle (4wd), 100 Trash Bags, 1 Hand Tools

LOGISTICS

DIRECTIONS: to site (by land and/or by water, to nearest launch ramp and are access permits required.)

From us 101 (west of S.B.) take Hollister Ave. Exit, towards ocean; turn right into Sandpiper Golf Course and continue right to the Ellwood plant. Good access from the Ellwood plant.

LAND ACCESS:

A. Access - Shorelines and streams in this site are accessible only through private property. Contact the landowner for permission to enter and information on road conditions. Beach access roads may require regrading before vehicles can enter or exit beaches. Barriers to longshore movement are variable according to tide and sand levels. Area may not be accessible in wet weather.
B. Access for ATV, 4-WD, and Heavy Equipment on beach.

WATER LOGISTICS:

Limitations: depth, obstructions:

Launching, Loading, Docking and Services Available: Santa Barbara Harbor is the nearest full service civilian harbor for full service berthing, launching and fueling. Response vessels could be loaded and small boats can be launched at Gaviota Pier with permission from State Beaches and Parks. Larger vessels can be loaded at Ellwood Pier with permission from Venoco and at Goleta Pier with permission from Santa Barbara County Parks.

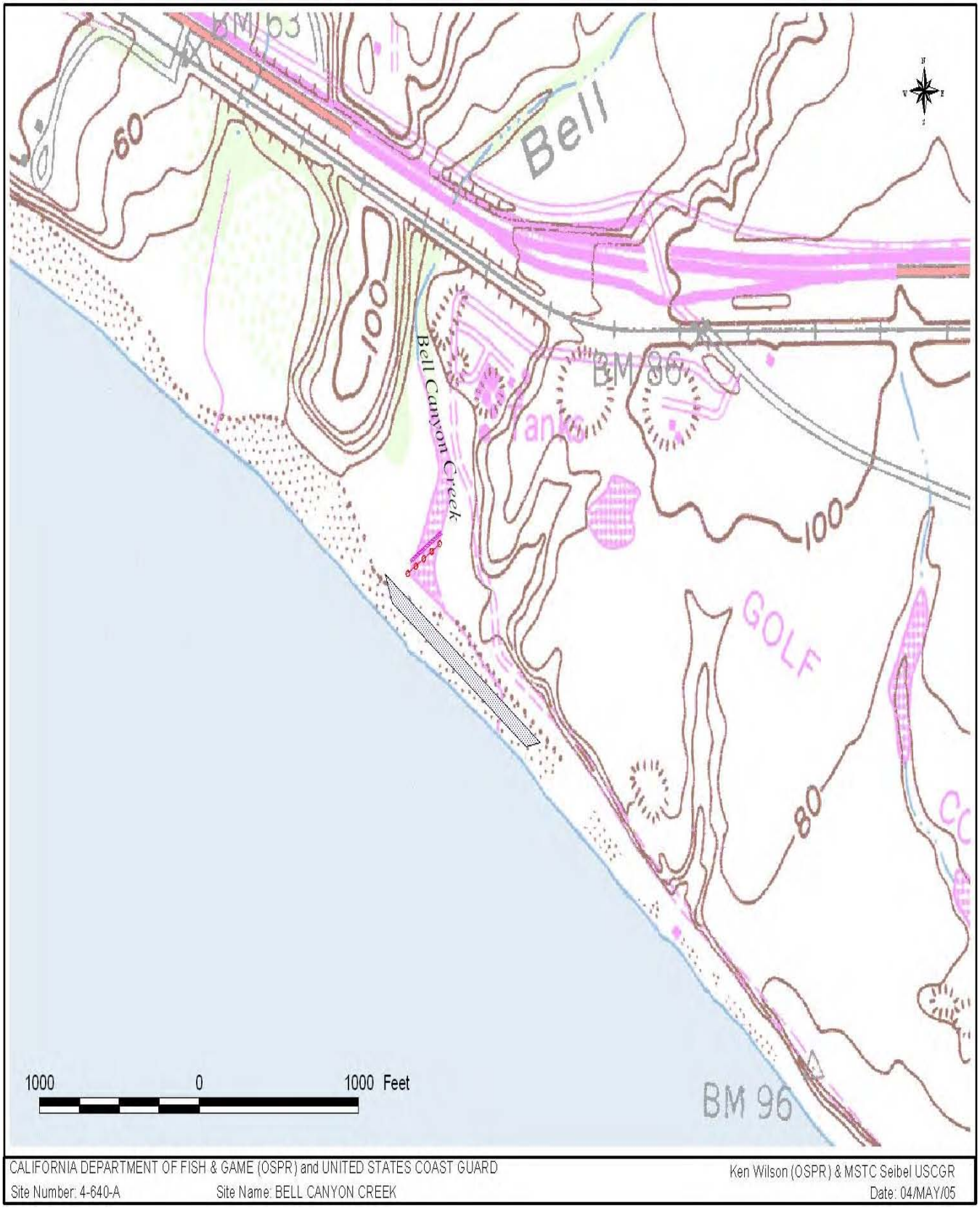
FACILITIES, STAGING AREAS, POSSIBLE FIELD POSTS AND EQUIPMENT AVAILABLE:

LOGISTICS:
Potential Staging Area: Ellwood Plant
Potential Command Post: Ellwood Plant
Closest Airport: Santa Barbara AP is 5 miles east.

COMMUNICATIONS PROBLEMS:

ADDITIONAL OPERATIONAL COMMENTS:

REMARKS CONT=D.
1. MONITOR STATUS OF BELL CANYON CREEK MOUTH - NATURAL SAND BERM DEVELOPMENT IS OFTEN POOR, OFFERING LITTLE PROTECTION.
2. THE VENOCO (formerly MOBIL) ELLWOOD ONSHORE FACILITY PROCESSES AND TRANSFERS OIL AND SOME NATURAL GAS FROM OFFSHORE THE PLATFORM, HOLLY. THE PLANT HAS SEVERAL TANKS BUT IS NOT AN OIL STORAGE FACILITY. VENOCO ALSO HAS A MARINE TERMINAL LOCATED APPROXIMATELY 2 MILES EAST OF THE OIL AND GAS PROCESSING FACILITY WHICH HAS TWO 65,000 BBL TANKS.
3. THIS SITE IS A REMOTE BEACH AND SO HAS RELATIVELY LOW PUBLIC RECREATIONAL USE (primary uses are surfing, and walking), HOWEVER, THE SANDPIPER GOLF COURSE AND THE BACARA SPA AND RESORT ARE LOCATED IN THE IMMEDIATE VICINITY THE ONSHORE FACILITY AND THE MARINE TERMINAL AND SHOULD BE CONSIDERED DURING ANY RESPONSE ACTIVITIES.



Harbor Boom
Swamp Boom
sss / sfs

Sorbent Boom
Other Boom
tsa / sps

Dike or Berm
Excellcior Fence
tba/voo

Site Summary- Devereaux Slough

4-645 -A

County	USGS Quad	Thomas Guide Location	NOAA Chart	Latitude N	Longitude W
Santa Barbara	Hurricane Deck	993 H x 4-5	18721	34.7500	119.8783

Last Page Update: 10/1/2005

SITE DESCRIPTION:

Lies just north of Coal Oil point. This 45 acre slough contains freshwater emergent vegetation, salt marsh, tidal flats and sand dune habitats. The mouth is generally cut off from the ocean by a well developed sand berm except during heavy rainfall. East and West of the slough are extensive medium-grained sand beaches backed by vegetated dunes. Large surf and strong winds are common, especially in winter. The slough is part of the larger coal oil point natural reserve, managed by the University of California at Santa Barbara.

SEASONAL and SPECIAL RESOURCE CONCERNS

Whenever the slough is open to the ocean, typically only during heavy rainfall, wetlands biota are at risk.

RESOURCES OF PRIMARY CONCERN

Intermittent coastal wetlands.

Western snowy plovers (all year), California least terns (Apr-Sep), American coot, American wigeon, Black-crowned night heron, Canvasback, Green winged teal (Mar-Jul), Mallard, Pintail, Red-breasted merganser.

Sea otters have been known to move through the area.

California spiny lobster.

Tidewater goby (Aug-Nov).

Eelgrass, Surfgrass.

CULTURAL, HISTORIC, and ARCHEOLOGICAL SENSITIVITIES

Cultural, Historical, and Archeological sites are known to exist in the area, however, the exact locations of these sites must be ascertained by contacting the Native American Heritage Commission at (916) 653-4082 and State Office of Historical Preservation (916) 653-6624, and/or the Central Coast Archeological Information Center (805) 893-2474.

KEY CONTACTS: Trustee (T); Entry/Owner/Access (E); Cultural (C); or Other Assistance (O)

Type	Name and Title	Organization	Phone (1st)	Phone (2nd)
	Mike Glassow	Central Coast Archeological Information Center	(805) 893-2474	
		Devereux Foundation	(805) 968-2525	
	Dave Ono Marine Biologist	DFG - Marine Region (Fisheries)	(805) 569-1221	
B	Kristine Barsky Marine Biologist	DFG - Marine Region (Nearshore Species)	(805) 985-3114	
B	Maurice Cardenas Fisheries Biologist	DFG - South Coast Reg 5 (Freshwater Species)	(805) 640-1852	
	Morgan Wehtje Wildlife Biologist	DFG - South Coast Reg 5 (Habitat	(805) 491-3571	
	UCSB	UCSB (Environmental Health and Safety)	(805) 893-3194	(805) 448-4089
		UCSB Campus Police - Dispatch 24 Hr #	(805) 893-3447	
	Cristina Sandoval Director - COP Reserve	UCSB Natural Reserve Sys. (Coal Oil Point)	(805) 451-2403	(805) 893-4127
		USFWS Ventura Office - Federally listed T/E species	(805) 644-1766	

ADDITIONAL SITE SUMMARY COMMENTS:

Excellent aerial photo of site can be found on the California Coastal Records Project website (http://www.californiacoastline.org/). Image number of site: 200404680 to 200404683

REFERENCES: 1. "CALIFORNIA COASTAL RESOURCE GUIDE" AND "CALIFORNIA COASTAL ACCESS GUIDE" BY THE CALIFORNIA COASTAL COMMISSION. 2. "INVENTORY OF COASTAL WETLANDS IN SANTA BARBARA COUNTY". INTERIM REPORT. BY: R. AMBROSE. 1993. 3. PROPOSED "*WESTERN SNOWY PLOVER CRITICAL HABITAT". BY: USFWS - VENTURA FIELD OFFICE. 4. "COASTAL INLET PROTECTION STRATEGIES FOR OIL SPILL RESPONSE - VOLUME 1." BY: RESEARCH PLANNING INC. 1993. 5. A*TIDEWATER GOBY 1996 DRAFT RECOVERY PLAN.

Site Strategy - Devereaux Slough

4-645 -A

County	USGS Quad	Thomas Guide Location	NOAA Chart	Latitude N	Longitude W
Santa Barbara	Hurricane Deck	993 H x 4-5	18721	34.7500	119.8783

Last Page Update: 10/1/2005

CONCERNS and ADVICE to RESPONDERS:

Primary spill threat from marine source. The primary objectives are to exclude oil from lagoon, pre-clean debris, and clean oil from shorelines. The lagoon is habitat for a Threatened/Endangered (T/E) fish. Two T/E birds nest in the dunes and upper beaches south of the River from Mar-Sept. Animals and habitat can be injured by oil/response activities unless responders minimize disturbance in lagoon, and associated vegetation; avoid disturbing the dunes and upper beaches; and only drive vehicles on wet sand; avoid trampling oil into sediments and follow protective conditions from IC and resource biologists.

HAZARDS and RESTRICTIONS:

Water Contamination - Unhealthy levels of coliform bacteria have been found intermittently in streams and on beaches in the Santa Barbara County area. Check with the Santa Barbara Ocean Quality Hotline, 805-681-4949, regarding health conditions prior to engaging in any activities which would require direct water contact. Use appropriate PPE, safety procedures, and include reference to potential health problems in any site safety plan.

SITE STRATEGIES

Strategy 4-645.01 **Objective: Booming - Deploy exclusion booms across the inlet entrance to protect sensitive species and habitats when suitable berm building materials are unavailable, water flows are too great, or water depths are too great for berming.**

Booming - Deploy exclusion booms across the inlet to minimize the likelihood of oiling the estuary. Place the booms in a configuration which forms an oil collection pocket which can be adjusted to accommodate changes in flow direction. Back exclusion booms with sorbent booms to minimize leakage. Line the shorelines and any side channels within the inlet to prevent collateral oiling. If there is skimmable oil present, deploy sorbents and contact the IC immediately regarding the use of skimmers and or other mechanical means for collecting oil. Monitor, adjust, and replace booms at least 2 x per day to maintain their integrity and effectiveness.

Strategy 4-645.02 **Objective: Berming - Prevent oil from contaminating the inlet when it is subject to tidal influence, low flows are present, and/or wave washover could occur if berm materials are present.**

Berming - First, consult with resource trustees regarding wildlife issues before undertaking this activity. Build an earthen berm across the mouth of the inlet using onsite materials obtained from unvegetated areas below the high tide line to minimize damage to wildlife and habitat. Install under flow pipes in the berm to allow through flows and/or a spillway with a filter barrier to accommodate flow increases as weather conditions dictate. Cover the berm with sheet plastic to minimize erosion. Second, back the berm with swamp and sorbent booms to prevent contamination from entrainment, leakage and or washover. If there is skimmable oil present, deploy sorbents and contact the IC immediately regarding the use of skimmers and or other mechanical means for collecting oil. Monitor berm and associated features to maintain their integrity and effectiveness.

Strategy 4-645.03 **Objective: Shoreline Precleaning - Prevent oiling of kelp, driftwood, vegetative debris, trash, and other materials to reduce collateral contamination and disposal problems.**

Shoreline Precleaning - Consult with resource trustees regarding wildlife issues before undertaking this activity. Remove and store kelp, driftwood, vegetative debris, trash, and other materials which could become oiled and create environmental hazards and disposal problems. Pre-cleaning of debris from shorelines will be conducted by hand crews to the greatest practical extent to minimize disturbance to wildlife and their habitats. If heavy equipment or vehicles are required for this operation, request consultation from resource trustees and contact the IC for authorization. Segregate and dispose trash. Replace unoiled debris in its former location once the threat of oiling is past.

Table of Response Resources

Strategy Number	Harbor Boom	Swamp Boom	Other Boom	Sorb Boom	Anchoring Systems		Boom Boats	Skiffs	Skimmers	Staff	
			Amount and Type		Num	Type and Gear			Num and Type	Deploy	Tend.ing
4-645.01		600		600	6			1	1	5	2
Special Equipment: 1 Stake Driver, 40 Stakes, 1 Waste Bin (20 yd), 1 Portable Oil Storage Tank OR Vacuum Truck											
4-645.02		400		400	4						
Special Equipment: 1 Front End Loader, 1 Roll Plastic, 3 Culvert Pipes, 20 Sand Bags, 15 Stakes (metal), 1 Stake Driver, 10ft Const. Fencing, 1 Waste Bin (20 yd), 1 Portable Oil Storage Tank, 1 Hand Tools											
4-645.03										5	
Special Equipment: 1- Vehicle (4wd), 100 Trash Bags, 1 Hand Tools											

LOGISTICS

DIRECTIONS: to site (by land and/or by water, to nearest launch ramp and are access permits required.)

From U.S. 101, North of Santa Barbara, take Storke road exit - south to Isla Vista (residential district for UCSB). At the corner of storke and el colegio roads, take slough road, south west to the reserve area parking lot (see map page 144-a).

LAND ACCESS:

A. Access - Shorelines and streams in this site are accessible only through private property. Contact the landowner for permission to enter and information on road conditions. Beach access roads may require regrading before vehicles can enter or exit beaches. Barriers to longshore movement are variable according to tide and sand levels. Area may not be accessible in wet weather.
B. Access for ATV, 4-WD, and Heavy Equipment on beach.

WATER LOGISTICS:

Limitations: depth, obstructions:

Launching, Loading, Docking and Services Available:	Santa Barbara Harbor is the nearest full service civilian harbor for full service berthing, launching and fueling. Response vessels could be loaded and small boats can be launched at Gaviota Pier with permission from State Beaches and Parks. Larger vessels can be loaded at Ellwood Pier with permission from Venoco and at Goleta Pier with permission from Santa Barbara County Parks.

FACILITIES, STAGING AREAS, POSSIBLE FIELD POSTS AND EQUIPMENT AVAILABLE:

Staging area: Coal Oil Point Reserve parking
Potential command post sites: Contact Devereux Foundation or UCSB. Also, UCSB Cliff House: operated by university center, 805-893-3961, is a potential on site command post.
Closest airport is in Santa Barbara, 2.5 miles east.

COMMUNICATIONS PROBLEMS:

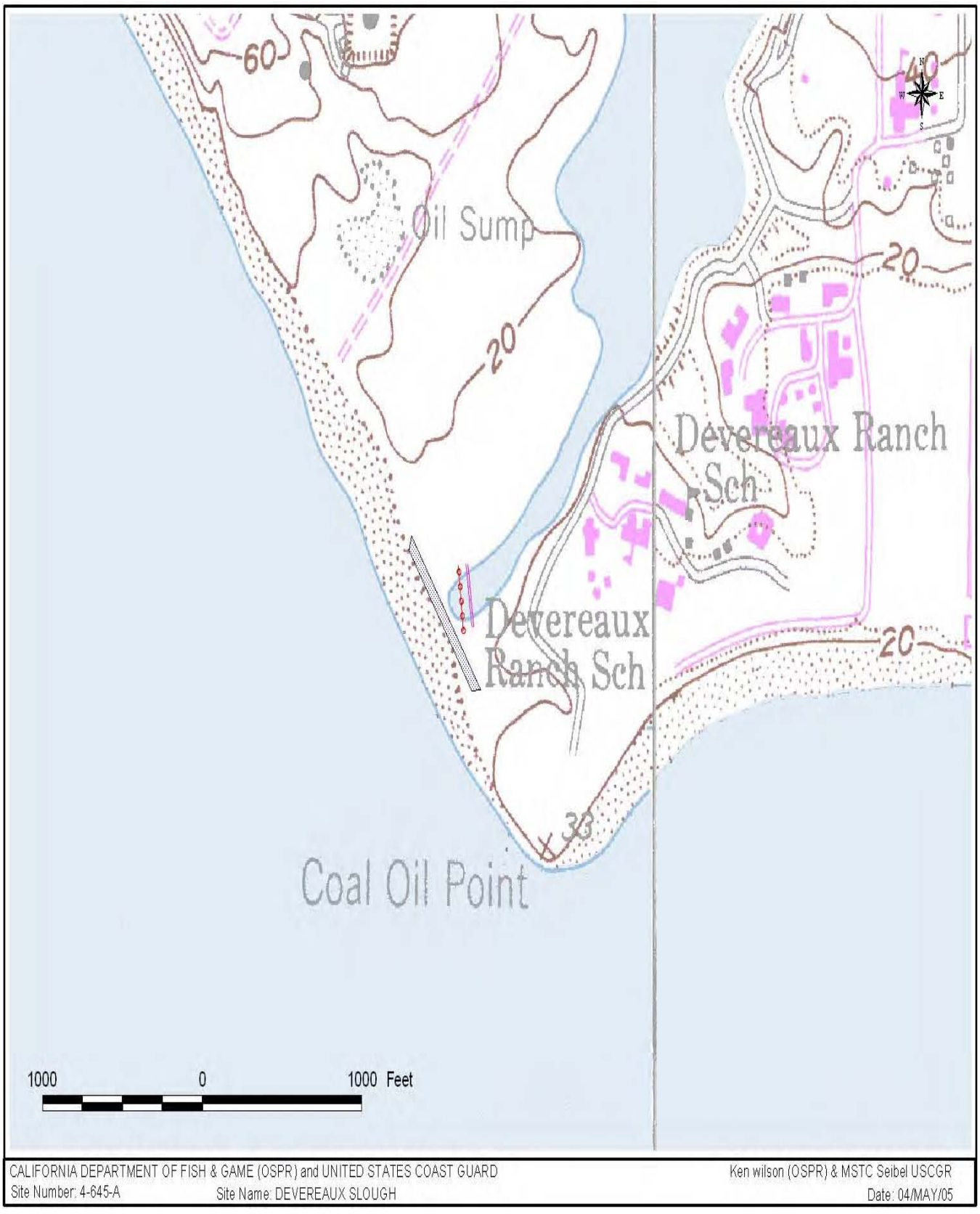
ADDITIONAL OPERATIONAL COMMENTS:

Due to the probable occurrence of Snowy plovers and/or Least terns at this site, please review the Sandy Beach Site Summary and Strategies (Site 4-000-A) for information on response operations when dealing with these sensitive species.

1. MONITOR STATUS OF MOUTH.
2. RESPONSE ACTIVITIES SHOULD AVOID IMPACTING FRAGILE DUNE VEGETATION.
3. UCSB HAS A WETLAND MANAGEMENT PLAN FOR DEVEREAUX SLOUGH.
4. MODERATE RECREATIONAL USE (primarily surfing) ESPECIALLY DURING SUMMER.
5. KNOWN OIL PIPELINES: Undetermined
6. KNOWN ARCHAEOLOGICAL SITES: Undetermined

FOR ADDITIONAL INFORMATION:
1. ENVIRONMENTAL SENSITIVITY INDEX (ESI) MAPS: SOUTHERN CALIF ATLAS. RPI

SPECIAL CONSIDERATIONS:
1. Federal and State Emergency permits may be required.
2. All cleanup operations in the general area should be conducted with the advice and cooperation of DFG, U.S. Fish and Wildlife Service and the Reserve Manager.
3. Aircraft Restrictions: Santa Barbara airport traffic patterns



Harbor Boom
Swamp Boom
sss / sfs

Sorbent Boom
Other Boom
tsa / sps

Dike or Berm
Excellcior Fence
tba/voo

Appendix D

TECHNICAL AIR QUALITY

APCD REPORTED FUEL USE AND BARGE TRIPS

Emissions Source	Reported Annual Fuel Use (gal/yr) 2003
Tug - Main Engine	12,130
Tug - Generator engine	3,060
Tug - Bow thruster or Aux.	560
Assist - Main Engine	1,630
Assist - Generator Engine	-
ER Boat - Main Engine	210
Barge	
Detroit Diesel 6V-71T	4,170
Cummins Pump prime mover	400
Exempt Detroit Diesel	2,650
TOTAL Fuel Use	**24,810**

Destination	Number of Trips (2003)
Trips to LB	23
Trips to Shores Terminal	0
TOTAL trips	**23**

Destination	Duration per Trip (hrs)
Trips to LB	10
Trips to Shores Terminal	30

Destination	2003 Hours
Trips to LB	230
Trips to Shores Terminal	0
Total 2003 hours	230

Emissions Source	2003 Gal/hr
Tug - Main Engine	52.7
Tug - Generator engine	13.3
Tug - Bow thruster or Aux.	2.4
Assist - Main Engine	7.1
Assist - Generator Engine	0.0
ER Boat - Main Engine	0.9
Barge	
Detroit Diesel 6V-71T	18.1
Cummins Pump prime mover	1.7
Exempt Detroit Diesel	11.5
TOTAL Fuel Use	**107.9**

* The fuel use per barge trip is based on 2003 data because reported fuel use and average fuel use per trip was highest for that year. It is assumed that one t daily emissions are based on the gallons of fuel used per trip. Annual emission the gallons of fuel used per trip multiplied by the assumed number of trips per y

Destination	Assumed No. of Future Trips
Trips to LB	16
Trips to Shores Terminal	8
TOTAL trips	**24**

Emissions Source	Annual Fuel Use for Projected Annual Hours
Tug - Main Engine	21,264
Tug - Generator engine	5,364
Tug - Bow thruster or Aux.	982
Assist - Main Engine	2,857
Assist - Generator Engine	-
ER Boat - Main Engine	368
Barge	
Detroit Diesel 6V-71T	7,310
Cummins Pump prime mover	701
Exempt Detroit Diesel	4,646
TOTAL Fuel Use	43,493

EMISSION FACTORS BASED ON FUEL USE FROM SANTA BARBARA COUNTY APCD PERMIT TO OPERATE NOS. 8232-R6 AND 8233-R6

Equipment Category	Description	Engine Size hp	NOx	ROC	CO	SOx	PM10	CO2*	Units
			EMT						
Tug Boat	Main Engines	4500	558.00	32.80	41.40	7.05	31.68	23,100	lb/1000 gal
	Generator Engines	500	617.40	42.00	133.00	7.05	42.00	22,960	lb/1000 gal
	Auxiliary Engines	500	617.40	42.00	133.00	7.05	42.00	22,960	lb/1000 gal
Assist Boat	Main Engines	2504	582.00	16.80	78.30	7.05	31.68	23,100	lb/1000 gal
	Generator Engines	250	617.00	42.00	133.00	7.05	42.00	22,960	lb/1000 gal
ER Boat	Main Engine	315	220.46	22.05	58.50	7.05	31.68	22,960	lb/1000 gal
Barge Jovalan	Detroit Diesel (6V-71T)	245	562.61	0.073	120.03	0.212	39.05	22,960	lb/1000 gal
VRU IC Engines	Cummins QSM11-P385*	385	215.20	14.35	124.81	0.19	6.70	22,960	lb/1000 gal
	Detroit Diesel (4V-71T)	89	567.09	45.1	120.99	0.212	40.33	22,960	lb/1000 gal

Notes to the Table

** The APCD Permits to Operate do not include emission factors for CO2. Therefore, CO2 emission factors are taken from US EPA's Compilation of Air Pollutant Emission Factors (AP-42) Section 3.3 for diesel engines less than 600 hp and Section 3.4 for diesel engines greater than 600 hp. These factors are given in units of lb/MMBtu heat input. These are converted to lb/1,000 gal of fuel input using the following conversion: lb/1,000,000 Btu x 140,000 Btu/gal x 1000 = lb/1,000 gal*

** Emissions for the Cummins Engine are provided in APCD Permit to Operate Nol 8233-R6 in units of g/hp-hr engine output. These are converted to lb/1000 gal fuel input in the above table using the following conversion: g/hp-hr x 1lb/453.6g x 1 hp-hr/6,454 Btu x 140,000 Btu/gal x 1000 = lb/1000 gal. The conversion of power output to power input (6,454 Btu/hp-hr) is specific to this engine and taken from Table 5.1-1 in APCD Permit to Operate No. 8233-R6.*

ESTIMATED DAILY EMISSIONS

Equipment Category	Description	Max Daily Fuel Use (gal/d)*	Estimated Daily Maximum Emissions (lb/d)					
			NOx	ROC	CO	SOx	PM10	CO2
Tug Boat	Main Engines	1,266	706.28	41.52	52.40	8.92	40.10	29,239
	Generator Engines	319	197.14	13.41	42.47	2.25	13.41	7,331
	Auxiliary Engines	58	36.08	2.45	7.77	0.41	2.45	1,342
Assist Boat	Main Engines	170	98.99	2.86	13.32	1.20	5.39	3,929
	Generator Engines	-	-	-	-	-	-	-
ER Boat	Main Engine	22	4.83	0.48	1.28	0.15	0.69	503
	TOTAL Tug Vessels		**1,043.32**	**60.72**	**117.24**	**12.94**	**62.05**	**42,344**
Barge Jovalan	Detroit Diesel (6V-71T)	435	244.81	0.03	52.23	0.09	16.99	9,991
VRU IC Engines	Cummins QSM11-P385*	42	8.98	0.60	5.21	0.008	0.28	958
Exempt ->	Detroit Diesel (4V-71T)**	277	156.81	12.47	33.46	0.06	11.15	6,349
	TOTAL Barge		**410.60**	**13.10**	**90.89**	**0.16**	**28.42**	**17,298**

Notes to the Table

** Maximum daily fuel use is assumed to be the hourly fuel use rate x 24 hours per day.*

ESTIMATED ANNUAL EMISSIONS

Equipment Category	Description	Annual Fuel Use (gal/yr)*	Estimated Annual Emissions (tpy)					
			NOx	ROC	CO	SOx	PM10	CO2
Tug Boat	Main Engines	21,264	5.93	0.35	0.44	0.07	0.34	245.60
	Generator Engines	5,364	1.66	0.11	0.36	0.02	0.11	61.58
	Auxiliary Engines	982	0.30	0.02	0.07	0.003	0.02	11.27
Assist Boat	Main Engines	2,857	0.83	0.02	0.11	0.01	0.05	33.00
	Generator Engines	-	-	-	-	-	-	-
ER Boat	Main Engine	368	0.04	0.004	0.01	0.001	0.006	4.23
	TOTAL Tug Vessels		**8.76**	**0.51**	**0.98**	**0.11**	**0.52**	**356**
Barge Jovalan	Detroit Diesel (6V-71T)	7310	2.06	0.0003	0.44	0.0008	0.14	83.92
VRU IC Engines	Cummins QSM11-P385*	701	0.08	0.005	0.04	0.00007	0.002	8.05
Exempt ->	Detroit Diesel (4V-71T)**	4,646	1.32	0.10	0.28	0.0005	0.09	53.33
	TOTAL Barge		**3.45**	**0.11**	**0.76**	**0.001**	**0.24**	**145**

Notes to the Table

**Annual fuel use is based on the estimated gallons per trip (from 2003 reported fuel use data) multiplied by the assumed 24 trips per year.*

CONSTRUCTION EMISSIONS

Construction Equipment	Equipment Equivalent	Engine Size (hp)	Fuel Type	Daily Usage	Daily Hours	Duration (days)	Total Operation (hours)	CO2 Emission Factor (lb/hp-hr)**	Annual CO2 Emissions (tpy)
Backhoe	Backhoe	115	Diesel	0.8	8	95	608	1.15	40.20
Bending Machine	Generator sets <50HP	22	Diesel	0.2	8	95	152	1.15	1.92
Compressor	Air Compressor (400 ACFM)	150	Diesel	0.4	8	95	304	1.15	26.22
Excavator/Dozer	Excavator*	86	Diesel	0.4	8	95	304	1.15	15.03
Dump truck	Dump Truck	250	Diesel	0.3	8	95	228	1.15	32.78
Grader	Motor Grader*	86	Diesel	0.5	8	95	380	1.15	18.79
Hydro Crane	Hydro Crane (45 ton)	225	Diesel	0.2	8	95	152	1.15	19.67
Hydrotest Pump Unit	Pumps	20	Diesel	0.4	8	10	32	1.15	0.37
Pickup Truck	Pick-up Truck (3/4 ton)	250	Gasoline	0.3	8	95	228	1.08	30.78
Side Boom Truck	Hydro Crane (18 ton)	130	Diesel	0.5	8	95	380	1.15	28.41
Tractor/Trailer	Tractor/Trailer (60 ton, 40 ft)	225	Diesel	0.4	8	95	304	1.15	39.33
Utility Tool Truck	Pick-up Truck (3/4 ton)	250	Gasoline	0.2	8	95	152	1.08	20.52
Vacuum Truck	Concrete Pump Truck (65 CY/hr)	90	Diesel	0.2	8	95	152	1.15	7.87
Water truck	Water Truck	200	Diesel	0.3	8	95	228	1.15	26.22
Welding truck	Welding Truck	50	Diesel	0.5	8	95	380	1.15	10.93
Drill rig (auger type)	Hydro Crane (18 ton)	130	Diesel	0.5	8	95	380	1.15	28.41
Cement Truck	Concrete Pump Truck (65 CY/hr)	90	Diesel	0.2	8	95	152	1.15	7.87
Fuel Truck	Water Truck	200	Diesel	0.3	8	95	228	1.15	26.22
Pile Driver	Air Compressor (400 ACFM)	150	Diesel	0.4	8	95	304	1.15	26.22
Generator	Air Compressor (400 ACFM)	150	Diesel	0.4	8	95	304	1.15	26.22
Mud Pump	Pumps	20	Diesel	0.4	8	10	32	1.15	0.37
10-ton Winch (Grundo)	Winch	35	Diesel	0.5	8	95	380	1.15	7.65
Well Service/ workover rig	Pick-up Truck (3/4 ton)	250	Gasoline	0.2	8	95	152	1.08	20.52
									0.00
						TOTAL Construction CO2 Emissions			**462.49**

*Excavators and motor graders are assumed to be the same engines size as backhoes.
**CO2 emission factors are taken from US EPA's Compilation of Air Pollutant Emission Factors (AP-42); Section 3.3 for diesel engines less than 600 hp.

Barrels of Oil Produced By the Proposed Project

Year	BOPD	Barrels of Oil Per Year
1	680	248,200
2	578	210,970
3	491.3	179,325
4	417.6	152,424
5	355	129,575
6	301.7	110,121
7	256.5	93,623
8	218	79,570
9	185.3	67,635
10	157.5	57,488
11	133.9	48,874
12	113.8	41,537
Total		**1,419,339**

Source: NOP

CO2 Emissions from End Products of Proposed Project

End Product	Barrels Produced by Project	Percent of a barrel	Pounds of CO_2 per Barrel of Refined Product	Pounds of CO_2 by Product
Finished Motor Gasoline	1,419,339	51.40%	822.94	600,370,768
Distillate Fuel Oil	1,419,339	15.30%	940.11	204,153,005
Jet Fuel	1,419,339	12.60%	885.98	158,445,752
Marketable Coke	1,419,339	5.00%	1356.46	96,263,900
Residual Fuel Oil	1,419,339	3.30%	1093.38	51,212,124
Liquefied Refinery Gas	1,419,339	2.80%	537.80	21,373,133
Total (Pounds)				**1,131,818,683**
Total (Tons)				**565,909**

Sources: CEC 2005
EIA 2006

Highest (Most Conservative) EMFAC 2002 (version 2.2, April 23, 2003)
Emission Factors for On-Road Heavy Heavy Duty Diesel Trucks
Projects in the SCAQMD (Scenario Years 2005 - 2025)
Derived from Wintertime Emissions Inventory
Heavy Heavy Duty Diesel Trucks (33,001 to 60,000 pounds)

The following emission factors were compiled by running the California Air Resources Board's EMFAC2002 (version 2.2) Burden Model and extracting the Heavy Heavy Duty Diesel Truck (HHDT) Emission Factors. When calculating on-road mobile source emissions from HHDT, use the following equation:

Emissions (pounds per day) = N x TL x EF

where N = number of trips, TL = trip length (miles/day), and EF = emission factor (pounds per mile)

The emission factors account for all emissions from start, running and idling exhaust. In addition, the ROG emission factors take into account diurnal, hot soak, running and resting emissions, and PM10 emission factor takes into account the tire and brake wear.

Scenario Year: 2005 -- Model Years: 1965 to 2005

HHDT-DSL	(pounds/mile)
ROG	0.00140276
CO	0.00630818
NOx	0.04154091
PM10	0.00077365
SOx	0.00040383

Scenario Year: 2006 -- Model Years: 1965 to 2006

HHDT-DSL	(pounds/mile)
ROG	0.00132058
CO	0.00593233
NOx	0.03893037
PM10	0.00073023
SOx	0.00040522

Scenario Year: 2007 -- Model Years: 1965 to 2007

HHDT-DSL	(pounds/mile)
ROG	0.00122652
CO	0.00552033
NOx	0.03563463
PM10	0.00064407
SOx	4.5721E-05

Scenario Year: 2008 -- Model Years: 1965 to 2008

HHDT-DSL	(pounds/mile)
ROG	0.00113305
CO	0.00511695
NOx	0.03244248
PM10	0.00059816
SOx	4.6012E-05

Scenario Year: 2009 -- Model Years: 1965 to 2009

HHDT-DSL	(pounds/mile)
ROG	0.00104234
CO	0.00473757
NOx	0.02945485
PM10	0.00055899
SOx	4.6121E-05

Scenario Year: 2010 -- Model Years: 1965 to 2010

HHDT-DSL	(pounds/mile)
ROG	0.00094808
CO	0.00433457
NOx	0.02580188
PM10	0.00050682
SOx	4.6075E-05

Scenario Year: 2011 -- Model Years: 1966 to 2011

HHDT-DSL	(pounds/mile)
ROG	0.00088783
CO	0.00406864
NOx	0.02211712
PM10	0.00047465
SOx	4.6099E-05

Scenario Year: 2012 -- Model Years: 1967 to 2012

HHDT-DSL	(pounds/mile)
ROG	0.00081302
CO	0.00378253
NOx	0.01938032
PM10	0.00043791
SOx	4.627E-05

Scenario Year: 2013 -- Model Years: 1968 to 2013

HHDT-DSL	(pounds/mile)
ROG	0.00074883
CO	0.00355134
NOx	0.01705448
PM10	0.00040816
SOx	4.6601E-05

Scenario Year: 2014 -- Model Years: 1969 to 2014

HHDT-DSL	(pounds/mile)
ROG	0.0006955
CO	0.00336447
NOx	0.01510009
PM10	0.00038308
SOx	4.7099E-05

Highest (Most Conservative) EMFAC 2002 (version 2.2, April 23, 2003)
Emission Factors for On-Road Heavy Heavy Duty Diesel Trucks (concluded)

Scenario Year: 2015 -- Model Years: 1970 to 2015

HHDT-DSL	(pounds/mile)
ROG	0.00065137
CO	0.00321682

Scenario Year: 2016 -- Model Years: 1971 to 2016

HHDT-DSL	(pounds/mile)
ROG	0.00061515
CO	0.00310152

NOx	0.01343702
PM10	0.00036187
SOx	4.6196E-05

NOx	0.01203788
PM10	0.00034394
SOx	4.697E-05

Scenario Year: 2017-- Model Years: 1972 to 2017
HHDT-DSL (pounds/mile)

ROG	0.00058512
CO	0.0030047
NOx	0.01083066
PM10	0.00032988
SOx	4.6272E-05

Scenario Year: 2018-- Model Years: 1973 to 2018
HHDT-DSL (pounds/mile)

ROG	0.00055817
CO	0.00292784
NOx	0.00978645
PM10	0.00031664
SOx	4.7128E-05

Scenario Year: 2019 -- Model Years: 1974 to 2019
HHDT-DSL (pounds/mile)

ROG	0.0005363
CO	0.00286171
NOx	0.00888017
PM10	0.00030521
SOx	4.6508E-05

Scenario Year: 2020 -- Model Years: 1975 to 2020
HHDT-DSL (pounds/mile)

ROG	0.00051782
CO	0.00280714
NOx	0.00810156
PM10	0.00029549
SOx	4.7336E-05

Scenario Year: 2021 -- Model Years: 1976 to 2021
HHDT-DSL (pounds/mile)

ROG	0.00051157
CO	0.00280652
NOx	0.00743784
PM10	0.00029008
SOx	4.7156E-05

Scenario Year: 2022 -- Model Years: 1977 to 2022
HHDT-DSL (pounds/mile)

ROG	0.0005011
CO	0.00278169
NOx	0.00692576
PM10	0.00028329
SOx	4.6978E-05

Scenario Year: 2023 -- Model Years: 1978 to 2023
HHDT-DSL (pounds/mile)

ROG	0.00049178
CO	0.00275935
NOx	0.00649093
PM10	0.00027778
SOx	4.6769E-05

Scenario Year: 2024 -- Model Years: 1979 to 2024
HHDT-DSL (pounds/mile)

ROG	0.00048347
CO	0.00273733
NOx	0.00612587
PM10	0.00027345
SOx	4.6515E-05

Scenario Year: 2025 -- Model Years: 1980 to 2025
HHDT-DSL (pounds/mile)

ROG	0.00047746
CO	0.00271633
NOx	0.0058219
PM10	0.00026883
SOx	4.6206E-05

CONSTRUCTION EMISSIONS

									Emission Factors (g/hp-hr)					Project Emissions (lbs)				
Equipment	Number	HP	Avg Load (%)	Em Fac. Code	hrs/day	day/wk	weeks	project hrs	ROG	NOx	SO2	CO	PM10	ROG	NOx	SO2	CO	PM10
A-Frame Truck	1	170	0.41	8	8	5	3	120	0.57	11.00	0.20	2.28	0.48	10.49	202.41	3.68	41.95	8.83
backhoe	1	115	0.47	2	8	5	3	120	1.95	8.80	0.19	7.34	1.21	27.53	124.23	2.68	103.62	17.08
Ditcher/Trencher	1	150	0.70	10	6	5	2	60	1.16	8.80	0.21	4.60	0.86	15.96	121.10	2.89	63.30	11.83
Flatbed trucks	1	170	0.41	8	8	5	3	120	0.57	11.00	0.20	2.28	0.48	10.49	202.41	3.68	41.95	8.83
Generator	1	40	0.74	10	12	5	2	120	1.16	8.80	0.21	4.60	0.86	9.06	68.77	1.64	35.95	6.72
loader	1	160	0.54	6	0	0	0	0	1.12	8.80	0.19	2.71	0.76	0.00	0.00	0.00	0.00	0.00
Mud Pump (trailer mounted)	1	100	0.74	10	6	5	1	30	1.16	8.80	0.21	4.60	0.86	5.67	42.98	1.03	22.47	4.20
Welding Truck	1	150	0.41	8	8	5	3	120	0.57	11.00	0.20	2.28	0.48	9.25	178.60	3.25	37.02	7.79
10 Ton Winch (Grundo)	1	35	0.80	10	8	2	1	16	1.16	8.80	0.21	4.60	0.86	1.14	8.67	0.21	4.53	0.85
Dump trucks	1	170	0.75	8	6	4	2	48	0.57	11.00	0.20	2.28	0.48	7.67	148.10	2.69	30.70	6.46
Fusion Machine	1	25	0.75	10	8	5	2	80	1.16	8.80	0.21	4.60	0.86	3.83	29.04	0.69	15.18	2.84
Hydrotest Pump	1	60	0.75	10	8	3	1	24	1.16	8.80	0.21	4.60	0.86	2.76	20.91	0.50	10.93	2.04
vacuum truck	1	170	0.75	8	8	3	1	24	0.57	11.00	0.20	2.28	0.48	3.84	74.05	1.35	15.35	3.23
Well Service/Workover Rig	1	400	0.80	10	12	2	2	48	1.16	8.80	0.21	4.60	0.86	39.20	297.37	7.10	155.44	29.06
X-Ray Truck	1	150	0.15	8	6	5	2	60	0.57	11.00	0.20	2.28	0.48	1.69	32.67	0.59	6.77	1.43
compressor	1	150	0.74	10	8	5	3	120	1.16	8.80	0.21	4.60	0.86	33.99	257.88	6.15	134.80	25.20
crane (45 ton)	1	225	0.47	10	8	5	1	40	1.16	8.80	0.21	4.60	0.86	10.79	81.89	1.95	42.81	8.00
Drilling rig	1	400	0.41	8	8	5	1	40	1.16	8.80	0.21	4.60	0.86	16.74	127.00	3.03	66.39	12.41
Tractor trailer	1	225	0.41	8	8	5	3	120	1.16	8.80	0.21	4.60	0.86	28.25	214.32	5.11	112.03	20.94
pile driver	1		0.47	10	4	5	1	20	1.16	8.80	0.21	4.60	0.86	0.00	0.00	0.00	0.00	0.00
cement truck	1	170	0.75	8	8	5		0	1.16	8.80	0.21	4.60	0.86	0.00	0.00	0.00	0.00	0.00
grader	1	86	0.47	5	8	5	3	120	1.95	8.80	0.19	7.34	1.21	20.81	93.90	2.03	78.32	12.91
fugitive dust		0.2		18	12	5	2	120					3.49					83.76
												Total	Lbs	259.17	2326.30	50.26	1019.51	274.44
													Tons	0.13	1.16	0.03	0.51	0.14

Emission factors from Venoco Application Equipment listfrom Table 2.2

*Emission factors from APCD Form 24 -Table 2, tied to Emission Factor Code above

						Emission Factors (gr/mile)					Emissions (lbs)				
	Number		Distance (mile/day)	day/wk	weeks	ROG	NOx	SO2	CO	PM10	ROG	NOx	SO2	CO	PM10
operations van	1		100	5	2	0.25	1.63	0.30	3.07	0.465	0.55	3.59	0.66	6.75	1.02
pickup truck	1		100	5	2	0.25	1.63	0.30	3.07	0.465	0.55	3.59	0.66	6.75	1.02
camera truck	1		100	5	1	0.25	1.63	0.30	3.07	0.465	0.28	1.79	0.33	3.38	0.51
x-ray truck	1		100	5	2	0.25	1.63	0.30	3.07	0.465	0.55	3.59	0.66	6.75	1.02
									Total	Lbs	1.93	12.55	2.31	23.64	3.58
										Tons	0.001	0.006	0.001	0.012	0.002

Emission factors from Venoco, Inc. Recommissioning Plan for Lease PRC 421.1, May 2004*

ROG, NOx, and CO factors from MVIE7G, 2002 vehicle mix. SO2 from SCAQMD CEQA manual, Table A9-5-L. PM10 from SCAQMD CEQA manual, Table A9-5-K-6. All factors at 55mph.

Estimated Emissions from Crude Oil Tanker Truck

Vehicle Emissions

Source	Emission Factors (g/VM)				
	NOx	CO	VOC	SOx	PM-10
EIR Appendix D	13.13	13.92	3.01	0.06	0.96
EPA[1]	7.59	11.20	1.96	NA	NA
SCAQMD[2]	14.72	2.32	0.51	0.02	0.27

	Trips per day	VM per trip	Total VM per day	Total VM per year
Crude Oil Tanker VM	4	35	140	51,100

Emissions	NOx		CO		VOC		SOx		PM-10	
	lb/d	tpy	lb/d	tpy	lb/d	tpy	lb/d	tpy	lb/d	tpy
EIR Appendix D	4.1	0.74	4.3	0.78	0.93	0.17	0.02	0.003	0.30	0.05
EPA[1]	2.3	0.43	3.5	0.63	0.60	0.11	NA	NA	NA	NA
SCAQMD[2]	4.5	0.83	0.7	0.13	0.16	0.03	0.01	0.001	0.08	0.02

[1] EPA emission factors are derived from AP-42 Volume II, Appendix H for calendar year 2008. The vehicle model year registration mix for July 1 of the calendar year was taken from Table 7.4 in Appendix H. The emission factors for low altitude heavy duty diesel powered vehicles for each model year in calendar year 2008 were taken from Table 7.11A.1 for VOC, Table 7.11B.1 for CO, and Table 7.11C.1 for NOx. The weighted average emission factor for each pollutant is calculated by multiplying the emission factor for each model year by the vehicle mix fraction for that model year and summing over all model years. AP-42 does not provide emission factors for SOx or PM.

[2] SCAQMD emission factors are taken from a table prepared by SCAQMD for heavy duty diesel truck emissions for projects in the SCAQMD for years 2005 to 2025. SCAQMD has developed the factors to account for the expected model year mix in each scenario year. Scenario year 2008 was selected to be consistent with the EPA emission factors.

PM-10 Emissions from Travel on Paved Roads (to be added to Vehicle PM-10 emissions)
(from AP-42 Volume 1, Chapter 13.2.1 - Paved Roads)

$E = k(sL/2)^{0.65} \times (W/3)^{1.5} - C$

Parameter	Value	Unit
k (particle size multiplier for PM-10)	7.3	g/VM
sL (road surface silt loading)[3]	0.2	g/m^2
W (vehicle weight)[4]	30	tons
C (emission factors for 1980 vehicle fleet)	0.2119	g/VM
PM-10 Emission Factor (g/VM)	51.47	g/VM

Emissions	PM-10	
	lb/d	tpy
AP-42	15.9	2.90

PM-2.5 Emissions from Travel on Paved Roads (there are no PM-2.5 vehicle emission factors)
(from AP-42 Volume 1, Chapter 13.2.1 - Paved Roads)

$E = k(sL/2)^{0.65} \times (W/3)^{1.5} - C$

Parameter	Value	Unit
k (particle size multiplier for PM-2.5)	0.66	g/VM
sL (road surface silt loading)[3]	0.2	g/m^2
W (vehicle weight)[4]	30	tons
C (emission factors for 1980 vehicle fleet)	0.2119	g/VM
PM-2.5 Emission Factor (g/VM)	4.46	g/VM

Emissions	PM-10	
	lb/d	tpy
AP-42	1.4	0.25

[3] Road surface silt loading is assumed to be ubiquitous baseline for roads with average daily traffic rate of 500 - 5,000
[4] Vehicle weight is assumed to be the maximum of the HDDV range of 60,000 lbs, or 30 tons.

Truck Transporation Alternative - Trucking Oil to Venoco Carpinteria Facility

Diesel Trucks Emission Factors*

ROC				CO	NOX	SO2	PM10			CO2
Exhaust Emission Factor (g/mile)	Hot Soak Emission Factor (g/trip)	Partial Day Diurnal Loss Emission Factor (g/hr)	Partial Day Resting Loss Emission Factor (g/hr)	Exhaust Emission Factor (g/mile)	Exhaust Emission Factor (g/mile)	Exhaust Emission Factor (g/mile)	Exhaust Emission Factor (g/mile)	Tire Wear Emission Factor (g/mile)	Break Wear Emission Factor (g/mile)	Emission Factor (g/mile)
1.687	0.143	0.002	0.001	14.995	17.499	0.016	0.594	0.031	0.028	1669.519

**Emission factors were determined using the California Air Resources Board mobile source emissions model EMFAC2007*
The model was run for heavy duty diesel vehicles in Santa Barbara County, with the default vehicle fleet mix with model years from 1965 to 2007
using the annual average temperature and relative humidity for Santa Barbara, CA of 59 degrees F and 60% relative humidity.
An average vehicle speed of 30 mph was assumed.

Assumptions

Each oil transportatin truck has a limit of	160	bbls/load (truck load capacity)
	6,720	gal/load (42 gal/bbl)
At 160 bbls/truck load, there will be	5	trucks per day

Emissions from Truck Operation

Parameters for transportation by 160 bbls/load trucks							
Engine Type	Number of Vehicles per Day	Distance per day (miles)	No. of days per year	Distance (miles)	Average Speed (mph)	Daily Operation Time (hr)	Annual Operation Time (hr)
Diesel	5	350	365	127,750	30	11.7	4258.3

Daily Emissions, lbs/day						Annual Emissions, tpy					
ROC	CO	NOx	SO2	PM10	CO2	ROC	CO	NOx	SO2	PM10	CO2
1.3	11.6	13.5	0.01	0.5	1,288	0.24	2.11	2.46	0.002	0.09	235.1

Emissions from Truck Loading

Emission Factor (lb/1,000 gal)*	Amount Transferred per Day (gal)	Amount Transferred per Year (gal)	Daily VOC Emission (lb/d)	Annual VOC Emission (tpy)
2	33,600	12,264,000	67.2	12.3

**Emission factor is from AP-42 Section 5.2 (Table 5.2-5) and corresponds to tank truck loading of crude oil with submerged fill loading operations in dedicated normal service.*

Appendix E

UCSB LEASE (PARTIAL)

existing pipelines, powerlines, and poles which are located in the acreage released pursuant to paragraph 1 above at the approximate locations shown on the attached Exhibit "B."

3. Said Terminal Agreements shall terminate on the earliest of the following dates:

(a) The date on which a suitable crude oil pipeline is available to replace the facilities presently utilized for the operation of the Phillips Marine Terminal located on said reduced area, or

(b) January 1, 2016.

4. Within 180 days after such termination, Phillips or its successors or assigns shall remove from said property, at their expense, all tanks and other equipment and installations, and all sumps, wastes, and debris, placed upon or under said property by them or their predecessors in interest.

5. The throughput payment under Said Terminal Agreements is hereby increased to two cents ($.02) per barrel of oil handled or shipped thereunder.

6. The provisions of Said Terminal Agreements, including this Agreement, shall be binding upon and inure to the benefit of University and Phillips and their respective successors and assigns.

7. University agrees and covenants that, with regard to the acreage released pursuant to paragraph 1 above, University, on behalf of itself and its successors and assigns, hereby waives any objection to the prudent and usual operation of the marine terminal by Phillips and its successors and assigns on the reduced area.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the day and year first above written.

UNIVERSITY EXCHANGE CORPORATION

By: Edward P. Cudd
Vice-President

Attest: Ronald Ratner
Assistant Secretary

PHILLIPS PETROLEUM COMPANY

By: B. R. Carver
Attorney-in-Fact

Appendix F

BEST MANAGEMENT PRACTICES

Best Management Practices

To minimize impacts to the environment from implementation of the proposed Project, the following best management practices are hereby incorporated into the Project. These measures would be overseen by environmental quality assurance monitors who would be present during construction activities:

- The use of a water truck as needed during construction operations, but not less than once per day during dry conditions, to keep dust levels caused by movement of vehicles down on the dirt access road.
- Demarcation of the boundary of all three wetland areas along the access road with orange construction fencing, to ensure people and equipment do not enter this area.
- Protection of the riparian area associated with Bell Creek, and the oak saplings east of the creek, by placement of hay bales along the top of the creek bank, to ensure equipment and people do not enter these areas.
- Pre-project and ongoing searches by project environmental monitors for snowy plovers or grunion on the beach, with the condition that if such species are spotted, work would stop or be redirected away from such species.
- Establishment of a 500' radius area on the seaward side of the project site to serve as a protection zone for marine mammals, with the condition that marine mammals spotted within this zone would trigger stoppage of any pile-driving activity. This zone size was chosen based on a National Marine Fisheries Service criterion of 160 dB (received level, as transmitted through water) as the level at which disturbance or harassment of marine mammals has been shown to occur from impulsive sounds like hammer pile driving.
- An initial gradual ramp up period for the pile driving unit, to full power, to ensure unseen marine mammals could move away if bothered by the noise or vibrations.
- Presence of a qualified Environmental Quality Assurance Program monitor under contract of the Santa Barbara County Energy Division onsite to continually assess possible impacts to biological resources, and suggest preventative actions.
- Schedule pile driving activities during periods of low tides to the maximum extent feasible to minimize potential noise impacts to marine mammals.
- A Fuel and Lubricant Drip Mitigation Plan and Spill Contingency Plan, which:
    - Outlines precautionary actions to avoid fuel spills on-site including the use of protective barriers to be placed under equipment during fueling, as well as banning any refueling of equipment on the beach.
    - Calls for the presence of two Oil Spill Response trailers at the EOF, containing materials and equipment to be utilized in the event of a spill or leak.
    - Allows minimal on-site refueling: Refueling of most mobile equipment offsite; refueling of large, difficult to move equipment in the lay down staging area at the EOF; refueling of non-mobile equipment on the access road, pier or caisson.
    - Prohibits refueling of any equipment or machinery on the beach or beach access ramp.
    - Includes the use of drip pans and fuel sorbant pads during refueling.
    - Calls for a Refueling Operations Log Sheet filled out each time refueling occurred.

    - Requires the inspection of hoses and containers to ensure they are free of cracks or signs of deterioration.
    - Requires the inspection of equipment on a daily basis for leaks, and filling out of a Daily Leak Inspection Form.
    - Prohibits overnight equipment storage on the beach.
    - Requires equipment to be removed from the beach and returned to the staging area at the end of each workday and during high tides;
    - Requires that equipment allowed on the beach was limited to the area between the beach access ramp and the caisson repair area.
- Consultation with the County Fire Dept. prior to commencement of the project.
- Maintenance of emergency vehicle access throughout the project.
- Adherence to an Emergency Response Plan tailored specifically for the SL 421 piers that details emergency response procedures and containment strategies in the event leakage occurs.
- Prohibition of alteration of the bluff face or toe.
- Complete deconstruction of the beach access ramp upon project completion and replacement of sand to its approximate former location.
- Repair to the dirt access road following non-project-related water damage, to ensure further erosion did not occur from use of the road for the project.
- Appropriate disposal of concrete debris, rebar, shaley mud, sand, contaminated water, and sorbant pads at off-site recycling service centers and waste management centers.
- Continued visual monitoring of the entire pier structure, as weather permits, for detection of new leaks is appropriate. Particular attention should be paid to the following areas:
    - The side and bottom perimeters of the new wall
    - The face of the new wall
    - The remainder of the old wall that has not been covered by the new wall. This includes both sides of the structure (East and West), in their entirety.
- Venoco will install and maintain warning signs during project construction.
- Minimize nighttime work
- Select and use of low noise-generating pile driving equipment.
- Equipment shall be returned to the staging area or the top of the pier at the end of each workday.
- The beach around the project site was regularly inspected for debris. If debris was found (such as concrete, rebar, etc) it was promptly removed and disposed of.
- When necessary, debris piles were temporarily stored on the upper reaches of the beach, overnight, for pick-up the next day. Whenever this occurred, the debris was marked with caution tape to prevent injury or hazard to members of the public.
- Public access to this stretch of beach will remain open to the public. Passersby will be allowed to pass underneath the pier as they would normally. Passage will only be restricted when construction activities posed a safety risk, as determined by the construction manager and/ or environmental monitor.

- The environmental monitor will inspect the beach around the project site regularly for debris. If debris are found (such as concrete, rebar, etc), construction crews will remove and disposed of promptly.
- Fill in any trenches dug in the seaward side of piers before the end of each workday.

- Photo-document the dirt access road and the City of Goleta roads before and after the project, to document road conditions and assess impacts, if any.
- Use plastic sheeting, placed behind the bottom panels of the new wall, to form a plug to prevent the cement slurry from seeping out from the new wall face.
- Use a vacuum truck to dewater soldier pile holes and to remove any excess concrete.

Appendix G

PIPELINE TRANSPORTATION SUB-ALTERNATIVE CONSTRUCTION AND OPERATION

G.1 Pipeline Construction

It is assumed that the pipeline would be constructed at an average speed of 500 feet per work day, as typically occurs in rural areas. Therefore, pipeline construction would take approximately 95 work days with an additional 10 work days for mobilization and 10 work days for demobilization. The machinery required for construction is listed in Table G-1. The peak day construction crew would consist of 40 persons, which include machinery operators, drivers, support personnel and management.

Table G-1. Pipeline Construction Machinery

Construction Equipment	Number During Peak Day	Daily Usage	Daily Use, Hours	Duration, Days
Backhoe	2	0.8	8	95
Bending Machine	1	0.2	8	95
Compressor	1	0.4	8	95
Excavator/Dozer	1	0.4	8	95
Dump truck	2	0.3	8	95
Grader	1	0.5	8	95
Hydro Crane	1	0.2	8	95
Hydrotest Pump Unit	1	0.4	8	10
Jack and Bore Machine	0	0.6	8	5
Pickup Truck	3	0.3	8	95
Side Boom Truck	2	0.5	8	95
Tractor/Trailer	1	0.4	8	95
Utility Tool Truck	2	0.2	8	95
Vacuum Truck	1	0.2	8	95
Water truck	1	0.3	8	95
Welding truck	4	0.5	8	95

G.1.1 Staging and Fabrication

Pipeline construction operations would require staging and fabrication areas. Fabrication sites are linear in configuration and involve a wide variety of welding, testing, and inspection equipment. Sufficient area must be provided for these critical pipe fabrication and storage areas during the installation operations.

Typically, pipe is trucked to the site and a boom crane is used to store pipe in a rack. Pipe is normally shipped in pre-coated 80-foot segments ready for welding. The pipe staging area that would be used for the pipeline construction would likely be the Ellwood Onshore Facility (EOF).

The major material component of the Project would be pipe. It would be stored at a vendor's coating yard, EOF, or existing storage yards until it is delivered to the pipeline route as necessary.

During all phases of construction, refueling and lubrication of construction equipment would occur at the contractors' staging yards, the EOF, or onsite. Equipment would be regularly checked for leakage.

G.1.2 Transport

Most of the heavy construction equipment would be delivered to the EOF site pipe delivery/staging yard on lowboy trucks or trailers. Access to the site would be from existing access roads and driveways. Mobile cranes and dump trucks would be driven in from local contractors' yards. Construction equipment would be left overnight at the EOF. All equipment would be lubricated, refueled and repaired by the contractor or local servicing companies.

All construction materials would proceed to the construction area by truck on existing roadways. The new pipe would be 6-inch outside diameter, 0.500-inch wall thickness pipe. A typical truckload of approximately 47,000 pounds would accommodate 18 joints of pipe or approximately 718 feet of pipe. A total of 74 one-way truckloads would be required to transport new 6-inch pipe to the EOF staging area.

G.1.3 Clearing and Grading the Right-of-Way (ROW)

Grading and cut-and-fill excavation would be performed in such a way as to minimize erosion and the effects on natural drainage and slope stability. Upon completion of construction, the ground surface would be restored to the original grade. Some excavation and grading outside the pipe ditch may be performed to increase the stability and decrease the gradient of unstable slopes. In designated areas, top soil would be segregated from other ditch spoil and replaced as part of surface restoration. Clearing would include the removal of above ground obstacles to the work such as trees, brush, crops, and boulders. Clearing also would include removal of tree stumps and roots in the ditch line that could interfere with operation of the ditching machine. Removal of only the trees, brush, and crops necessary for construction and maintenance would be permitted. The minimum feasible amount of vegetation would be removed, and the removed vegetation would not include threatened or endangered species.

Where fences are encountered along the ROW, adequate bracing would be installed at each edge of the ROW prior to cutting the wires and installing temporary gates. Upon completion of construction, the fence would be reconstructed to its original condition or better.

An area 25 ft in width, along a frontage, would be needed on each side of roads, railroads and minor water crossings that require boring. Additional storage areas for equipment, pipe, and other materials would be acquired through private permission or temporary use permits.

The pipeline ditch would be open for as little time as practical with stringing usually preceding ditching. Pipe-stringing trucks would be used to transport the pipe in 40-foot to 80-foot lengths from a shipment point or storage yards to the pipeline ROW. Side booms would carry the line pipe from the stringing trucks and lay it end to end beside the ditch line for future line-up and welding. Turnaround areas for stringing trucks would be provided by using existing roads.

G.1.4 Ditching

Once the ROW has been prepared, ditching operations would begin. Ditching would include all excavation work required to provide a ditch of the specified dimensions and depth of pipe cover. A standard dimension ditch, from a minimum of about 3 feet to a maximum of about 4 feet wide, would be centered on a line near the edge of the 12-foot wide ROW, thus providing about 8 feet of working space and an area in which to place ditch spoil. A standard dimension ditch would be excavated mechanically with ditching machines. In areas where loose or unconsolidated rock is encountered, the ditch would be excavated using backhoes and clam shell buckets. An exception to the mechanical excavation would be hand-digging to locate buried utilities, such as other pipelines and cables. Based on the geology traversed by the pipeline route, no blasting would be expected.

The depth of the ditch would vary with the conditions encountered. Normal pipeline construction places lines at a depth of 48 inches to 60 inches to the top of pipe depending on the location. When crossing over and under other pipelines, cables, etc., a minimum clearance of 12 inches would be standard. The 12-inch clearance may be reduced if special precautions are taken to prevent interference. Rock excavation would require that at least 18 inches of cover be placed over the pipe. These depths meet or exceed the California State Fire Marshal requirements per the U.S. Department of Transportation (DOT) and

the Code of Federal Regulations (CFR) Title 49, Part 195, Transportation of Liquids by Pipeline.

Occasionally, the ditch would be excavated to greater depths. For instance, when the pipeline traverses areas for which there are definite plans to level the land for irrigation or other purposes, the pipe would be buried at a depth that would permit the land to be leveled. When crossing canals, borrow ditches, or irrigation ditches that are dredged to maintain depth, the pipeline ditch would be excavated to a depth that would permit safe dredging operations. At railroad and road crossings, the depth of the pipe would conform to appropriate regulations.

G.1.5 Pipe Coating

State of the industry pipeline coating would be applied at the mill before delivery to the construction site. However, field coating would be necessary on all field weld joints made at the site in order to provide a continuous coating along the pipeline. After the pipe has been welded and radiographically inspected (x-rayed), heat shrink polyethylene sleeves would also be used or alternatively, polyken tape and tape primer. The use of heat shrinkable products or shrink sleeves is the most dominant method used to protect joints worldwide due to:

- design flexibility and compatibility with pipeline conditions and pipe coatings, and
- high reliability and superior service performance.

Polyethylene heat shrinkable sleeves are used as the primary method to protect pipe joints from corrosion. These sleeves are wrapped around the pipe joints where there is exposed unpainted metal. The sleeves are then heated using a propane torch to the proper installation temperature. The sleeves are made with a thermochromic pigment that changes color when the proper installation temperature is reached, making installation fast and easy. Upon heating, the sleeve contracts, encapsulating the joint and at the same time squeezing sealant into all surface irregularities forming a tight seal. This seal is very effective at protecting the joint from moisture and air ingress to the pipe surface.

Protecting the pipe from moisture and air would help prevent the pipe from corroding. The prevention of corrosion would in turn prevent any cracks, breaks, and leaks caused by the corrosion of the pipe. The sleeves are also engineered to withstand the effects of temperature cycling, soil stress, hydrostatic pressure and chemical attack.

Shrink sleeves are very reliable in preventing moisture from contacting pipe and have been used for over thirty years. As technology has increased in reliability and durability, so has the shrink sleeve. Quality control ensures that raw materials, in-process materials and the finished products are subjected to exhaustive testing to comply with strict specifications. Quality assurance procedures permit traceability of every component throughout the manufacturing process. This ensures that the shrink sleeves would be compliant with all applicable safety and protection requirements.

A “holiday detector” would be used to locate any coating discontinuities (such as thinning, or other mechanical damage) that could permit moisture to reach the pipe. The testing device develops an electrical potential between the pipe and an electrode in contact with the outside of the coating or ground. Pinholes in the coating of microscopic size can be located using the electrical detector. All coated pipe, including field joints, fittings, and bends would be tested.

G.1.6 Testing and Inspection

All field welding would be performed by qualified welders to Venoco's specifications and in accordance with all applicable ordinances, rules, and regulations, including American Petroleum Institute (API) 1104 (Standard for Welding Pipe Lines and Related Facilities) and the rules and regulations of the DOT found in 49 CFR (Part 195 for liquid pipelines). As a safety precaution, a minimum of two 20-pound dry chemical unit fire extinguishers would accompany each welding station.

All welds (100 percent) would be visually and radiographically inspected for exceeding the 10 percent inspection requirement found in 49 CFR Part 195. Radiographs would be recorded and interpreted for acceptability according to requirements of API 1104. All rejected welds would be repaired or replaced as necessary and re-radiographed. The x-ray reports as well as records indicating the location of welds would be kept on file for the life of the pipeline.

In addition to standard mill testing of all pipe and fittings, hydrostatic testing would be performed after construction and prior to startup. Federal DOT regulations (49 CFR Part 195) mandate hydrostatic testing of new, cathodically protected oil pipelines prior to placing the line into operation.

The hydrostatic test involves filling the pipeline with water and increasing pressure to a predetermined level. This pressure level would be maintained at

least 1.25 times the pipeline maximum operating pressure for a minimum of 8 hours. Such tests are designed to prove that the pipe, fittings, and weld sections would maintain mechanical integrity without failure or leakage under normal operating pressure.

Permanent records would be kept on each hydrostatic test. These records would contain the exact location of the test segment, the elevation profile, a description of the facility, and continuous pressure and temperature of the line throughout the test. Deadweight testers would be used to verify the accuracy of pressure-recording devices and charts during the test, as required by 49 CFR Part 195.

Water would be pumped into the pipeline using existing pumps at the EOF. A high-pressure portable test pump would be used to bring the pipeline up to test pressure. The test pressure and pipeline temperature would be continuously monitored for any changes for a minimum 8-hour period, in accordance with Federal and State regulations.

At the conclusion of the test, water in the pipeline would be bled back into the produced water treatment system at the EOF. Nitrogen gas would be pumped into the pipeline from the AAPL receiving station to displace the seawater back to the EOF. Pigs would be utilized on the 6-inch pipeline to effect total displacement of the water with nitrogen. The pipeline would be left packed with nitrogen at low pressure to prevent corrosion until the pipeline is placed into service.

G.1.7 Lowering and Tying-In

The pipe would be lifted and lowered into the ditch by two or more side-boom tractors spaced so that the weight of unsupported pipe would not cause buckling or other damage. Cradles with rubber rollers or padded slings would be used so the tractors can lower-in the pipe as they travel along the ditch without damage.

Tie-in welds would be required whenever there is a break in the continuous operation of the main-line pipe crews. This would occur at road crossings, water crossings, block valves, and other special locations. Tie-in welds are usually made in the ditch at the final elevation and each weld requires pipe handling for line-up, cutting to exact length, pipe cleaning and coating, and backfilling in addition to normal welding and weld inspection.

G.1.8 Backfilling

A variety of backfilling procedures would be used to perform the work effectively and economically and to comply with specifications regarding protection of pipe and coatings. Motor graders, angle dozers, and modern backfill machines would be used to move dirt from the spoil bank to the ditch. Where specified, the backfilled earth would be compacted in accordance with the specifications of various interested agencies to avoid later settling. In certain areas where damage might occur to the pipe coating, protection would be provided by padding the ditch with Rockguard (protective coating), clean sand, or earth backfill.

G.1.9 Special Construction Techniques

In most cases, roadbeds supporting roadways or railroads would be crossed by boring a hole horizontally from one side to the other. The cutting head of the boring auger would be slightly larger than the casing pipe or line pipe. The pipe would be installed immediately behind the cutting head as it advances. Bore and reception pits are necessary. Bore pit dimensions would typically be 10 feet wide by 15 feet long by 8 feet deep. Steel casing would be used to encase road crossings where required by Federal, State, local, or railroad authorities. Steel casings would be utilized for crossing rail lines and Highway 101.

G.1.10 Receiving, Custody and Metering Station Construction

Work at the AAPL receiving station would take approximately two months. Work required to construct the AAPL receiving station includes:

- Civil work including construction of equipment foundations. New foundations would be constructed to support above ground piping after the pipe is installed. Piping work would include installation of a new pig receiver, custody transfer oil meters, installation of a fixed meter prover, connection to the existing AAPL pipeline, and installation of associated support utilities for lighting, power, and monitoring and controls.
- Electrical crews would install new conduits and wires for Supervisory Control and Data Acquisition (SCADA) System pipeline leak detection and instrumentation at the AAPL.

G.2 Pipeline Operation and Maintenance

G.2.1 System Operation

The proposed pipeline would be monitored and operated from the EOF. The EOF would provide for continuous monitoring 24 hours per day. No additional

positions to the existing staff would be required as a result of this transportation option.

G.2.2 System Control, Operation and Safety Features

The proposed computerized system of pipeline communications and system control is referred to as the SCADA System. The function of this system is to send instructions to and receive information from Programmable Logic Controllers (PLCs) located at the EOF and the AAPL station for use by automatic controls, automatic safety systems and operators in monitoring pipeline operations. The Master Station or Control Center would be located at the EOF. The Master Station would originate remote control commands and receive status and alarm data from the PLCs. The PLCs would receive and execute valid commands from the Master Station and transmit alarm and status information back to the Master Station. The SCADA computer system would be programmed to continuously scan for leaks and annunciate alarms.

A number of backup systems and redundant equipment would be used to ensure the proper function of the SCADA System. These systems include backup computers and peripheral equipment that would be located at the Master Station to increase reliability and allow for maintenance and repair of control equipment without disruption of normal pipeline supervision and control. In the case of a short power outage, an uninterrupted power supply (UPS) would supply the central control facility for approximately four hours.

The Master Station would communicate with the PLC at the EOF through a hard-wired connection. Communication to the AAPL PLC would be accomplished through leased telephone circuits with a radio backup. In the event of a failure in the primary and backup communication systems, an operator, with company provided handheld communications radio and telephone, would be dispatched to the AAPL station.

Operators at the EOF Control Center would have the ability to initiate and terminate flow into the pipeline from the EOF, start and stop pumps, as well as monitor line pressures, temperatures, flow rates, and operate inlet and outlet valves. Any equipment failure and operation alarms would be transmitted to the operator for corrective action. A deviation in input and output volume or pressure would trigger such an alarm.

The Oil Shipping Pumps would be equipped with various safety devices such as pressure sensing devices, and electrical current and temperature measuring devices to assure reliable and safe operation. The pipeline would be protected from over pressure by three levels of protections: pressure control valves, high-pressure shutdown switches, and pressure relief valves. The computerized SCADA System constantly gathers operational data from the critical sources throughout the system and automatically adjusts the pressure and flow rate of the pipeline to provide for safe operation of the pipeline. The SCADA System also provides for continuous leak detection monitoring and displays that allow operators to see real time operating data for the pipeline.

The pipeline leak detection system to be installed would consist of three components: (1) volumetric balance, (2) flow difference monitoring, and (3) pressure/flow monitoring. The system would be able to detect a leak as small as 1 percent of flow. At the approximate maximum flow rate of 13,000 BPD, this would result in the ability to detect a leak as small as 5.4 barrels in one hour or 0.09 barrels in one minute.

The volumetric balance component of the SCADA System, in addition to using metered input and output volumes in its calculations, takes into account the changes in real pipeline conditions represented by net volume changes in pipeline capacity and is calculated once per minute. The volumetric change is calculated and then rolled into six integration periods to determine system loss. Each integration period is compared against pre-defined limits so that when a violation of a limit occurs, the operator is alerted through an alarm.

Flow difference monitoring consists of checking for unexpected differences in pipeline flow into the pipeline at the EOF and out of the pipeline at the AAPL. If the total flow out of the pipeline at the AAPL minus the total flow into the pipeline at the EOF is greater than a predetermined maximum variation, an alarm is issued to the operator and the Control Center.

The third component of the SCADA System is the pressure/flow monitoring to check for rapid changes in the pressure and/or flow rate on the pipeline. Pressure and flow variation limits are configured for use in comparing the actual telemetered data with the expected values. Running averages are maintained for these sampled pressure and flow rates over pre-defined periods of time. The system projects the next sample by calculating the slope of the current deviations

using the period as the base and a configurable number of samples up to a maximum of 15. If the resultant value falls outside a pre-defined limit, a second check is performed after the next sample against a different pre-defined limit. If this limit is also violated, a pressure deviation alarm is generated.

If both pressure limits are violated, flow rate deviation processing begins and continues for the configured period of time. Flow rate deviations are calculated using the same technique as for pressure deviations. Flow rate processing only takes place when there is an active pressure violation.

G.3 System Inspection and Maintenance

G.3.1 Visual Inspection

The pipeline route would be visually inspected at least once each week by line rider patrol, which is more frequent than required by DOT requirements (49 CFR Part 195 requires visual inspection 26 times per year) to spot third-party construction or other factors that might threaten the integrity of the pipeline. Additionally, inspection of highway, utility, and pipeline crossing locations would be conducted in accordance with State and Federal regulations. Pipe protection level would be inspected annually at all test locations, quarterly at control points, and more than quarterly at cathodic protection systems to ensure corrosion control.

G.3.2 Pigging

Pigs or scrapers are devices inserted into the pipeline at pig launcher points and retrieved at receiving points called pig receivers or scraper traps. Pigs are used to clean and/or inspect the pipeline.

"Smart" pigs are devices used to inspect and record the condition of the pipe. Smart pigs detect where corrosion or other damage has affected the wall thickness or shape. The pipeline would be designed to be capable of running smart pigs in accordance with DOT standards.

G.3.3 Pipeline Hydrostatic Testing

A five-year hydrostatic test is required by DOT for Hazardous Liquid Pipelines per 49 CFR Part 195. The hydrostatic test is identical to the test performed for newly constructed pipeline, except that the test period is reduced from 8 hours to 4 hours. The test is performed to prove that the pipe, fittings, and weld sections

can continue to maintain mechanical integrity without failure or leak under test pressure conditions.

G.3.4 Valve Inspection

Block valves are cycled and inspected twice annually, not to exceed seven months between inspections, to ensure proper operation (per 49 CFR 195.420).

G.3.5 Cathodic Protection System Testing

Several procedures are used to monitor and test the effectiveness of the cathodic protection system installed on pipelines. The cathodic protection system consists of power sources called rectifiers, buried anodes, and test stations along the pipeline. For the proposed pipeline, only two rectifiers would be necessary, and would be installed at the EOF and at the AAPL. The rectifiers would be checked weekly to ensure that they are operating properly. Quarterly, voltage and current readings are recorded for the rectifiers and voltage readings at critical test stations are measured and recorded. Annually, a complete pipeline survey of the voltage readings at all test stations are measured and recorded. If the data indicate that potential problem areas exist on the pipeline, voltage readings are taken all along the suspect areas using a technique called a close interval survey. Adjustments are made to the system, as required, when test data indicate that voltage levels are outside of the design limits.

G.3.6 Emergency Response

Venoco has prepared an Emergency Action Plan (EAP) to specify measures to be taken in emergency scenarios for its existing facilities. An Oil Spill Response Plan (OSRP) is incorporated into the EAP, which covers Venoco's nearby facilities. The EAP identifies the responsible parties for the Incident Command System and the supporting organizations/agencies. The EAP would be updated to reflect the new EOF to AAPL pipeline.

Venoco has a contractual agreement with a regional spill response cooperative (Clean Seas) that serves as the emergency response contractor with primary responsibility for containment, cleanup, and health and safety. The EAP lists third-party contractors providing manpower and equipment such as vacuum trucks, boats, oil skimmers, absorbent and skirted booms, dump trucks, portable tanks, absorbent materials, dispersants, steam cleaners, hydroblasters, cranes, and forklifts. These contractors are located in the Tri-County regional area. In addition, operations personnel are trained in the Incident Command System and oil spill containment and cleanup procedures.

Appendix H

MITIGATION MEASURES FROM THE ELLWOOD MARINE TERMINAL LEASE RENEWAL PROJECT ENVIRONMENTAL IMPACT REPORT

Mitigation Measures from the Ellwood Marine Terminal Lease Renewal Project Environmental Impact Report

These MMs were obtained from the EMT EIR Section 4.2, Hazards and Hazardous Materials

HM-1a. Reduced Crude Oil Hydrogen Sulfide Content. The Applicant shall institute measures to reduce the crude oil hydrogen sulfide content before the crude oil leaves the EOF. These measures could include increased crude oil scrubbing or other measures to reduce the hydrogen sulfide levels in the crude oil.

HM-1b. EMT Tank Maintenance Program. The Applicant shall, within 6 months time, develop and submit to the CSLC and the County of Santa Barbara for review and approval, a tank maintenance program for the EMT crude oil tanks that addresses inspections, inspection frequency (both external and internal), maintenance of tank shell and appurtenances, non-destructive testing, cathodic protection, dike and drain maintenance, and seismic analysis and retrofits to ensure tanks conform to current building codes. API 653 full tank inspections should be conducted by a registered API 653 tank inspector at least every 5 years.

HM-3a. Loading Line Vacuum/Evacuation Operations. The Applicant shall ensure that the loading line can be operated in a vacuum and that operation in a vacuum is established as part of the terminal operations manual and as part of the oil spill response. In lieu of vacuum operation, applicant could implement a method for evacuating the loading line in the event of a leak. Evacuation of the line should be possible at all times during loading (even when barge is empty).

HM-4a. Loading Pipeline Leak Detection. The Applicant shall ensure that both the shipping end and the receiving end of the loading pipeline are equipped with flow meters and that the flow meters utilize a means of conducting automatic and continuous flow balancing to an accuracy of at least 2 percent. Any deviations shall activate an alarm system at both the shipping and receiving locations. All loading operations shall be observed by an operator who is on duty at all times during loading to ensure rapid detection of leaks or spills.

HM-5a. Loading Booms. The Applicant shall pre-boom all oil transfers using booms that are effective for the ocean conditions at the EMT location. For

loading operations, the boom shall enclose the water surface surrounding three sides of the vessel to provide containment for the vessel at the waterline (the seaward side of the vessel may remain unboomed to allow for vessels to reach the barge in the event of an emergency). The boom shall be deployed so that it provides a stand-off of not less than 4 feet (1.2 m) from the outboard side of the vessel.

HM-6a. Loading Pipeline Integrity Inspections. The Applicant shall investigate and utilize, if applicable, a non-destructive testing procedure, which will enable inspection of the loading pipeline from the pump-house to the hose connection for both corrosion, internal and external, and for allowable pipe stresses due to settling. The Applicant shall also conduct pressure testing of the pipeline annually at 125% MAOP for 4 hours. A program of GUL, or equivalent, testing of the pipeline as far into the intertidal zone as practical should be established with testing at a minimum of every 3 years. Close interval cathodic protection testing should be conducted every 3-5 years to ensure that the cathodic protection system is operating correctly the entire length of the pipeline.

HM-7a. EMT Spill Protection. The Applicant shall install drain protection in the form of sealable coverings, valves, or other method to prevent flow of spilled oil through the drains, on the EMT drains located at the far southern end of the EMT, immediately near the pumps and on the far side of the control shack. The drain protection would prevent a spill of crude oil that occurs at the loading pumps and/or at other EMT equipment from entering the drains and affecting the slough. Berms located at this end of the EMT should also be checked to ensure they can contain a worst case discharge from the pumps.

HM-8a. Response Drills and Planning. The Applicant shall conduct periodic equipment deployment and on-water drills utilizing the response vessel (the Penguin) as well as other vessels that would respond to a drill. Drills should have a post-drill lessons-learned evaluation which is incorporated into the training and EAP documentation. Procedures for conducting drills should be detailed on the EAP.

HM-9a. Double Hull Barges in Near Term. The Applicant shall replace the barge Jovalan with a double-hulled barge, or convert the Jovalan to a double-hilled vessel within 18 months of lease approval.